The Builder.

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The Present Condition of Ecclesiastical Architecture in Germany.

WHEN in future ages the history of the nineteenth century shall be written, no more striking event will be chronicled than the fact that a style of architecture disused for about three centuries again came into use, and that not only in one country, but all over Europe. These pages, from time to time, give specimens of the revival of Gothic architecture in England; and on many occasions we have alluded to the gigantic progress that that style of architecture has made in France within the last twenty or thirty years. Holland, Belgium, and Germany have also come under our notice; and we purpose now to give our readers a more extended account of the works in progress, and the present condition of Gothic architecture in the last-named country. In order thoroughly to understand the present condition of architecture in Germany it is necessary that we should take a retrospective glance at the history of art in that country.

The architecture which we call Gothic was not so early in use in Germany as in France or England. The Germans seem to have made use of the Round-arched or Romanesque style for nearly a century after it was abandoned in England. It must, however, be acknowledged that the Germans carried the Romanesque style to a pitch of excellence and perfection that it never reached in any other country. If, however, the Germans were the last people—except the Italians—to adopt the Gothic style, they clung to it with the greatest tenacity, and were certainly the last people in Europe to abandon it. This will be seen by referring to the dates of many of the Gothic buildings in Nuremberg and Augsburg, and particularly the Jesuit churches at Coblenz, Cologne, and Paderborn, all of which were built after the year 1600, and yet are thoroughly Gothic in style, although there is a slight admixture of Italian work in some of the minor details. Nor are these isolated examples, for along the banks of the Maine are many village churches of even later date whose chief features —windows, doorways, &c.—are quite Gothic, although the other portions of the buildings are Italian. The thirty years' war, however, put an end to all architecture, and the churches built after that struggle are Italian. The Roman Catholic churches, though often vulgar and gaudy, are sometimes rich and costly in the extreme. The Protestant churches of this date are remarkable only for their meanness and absence of architecture. The French revolution, and the events consequent upon that overthrow of everything ancient, put the finishing stroke to the destruction of architecture in Germany. The Prince-Bishops, who had been the great patrons of ecclesiastical architecture, were driven from their sees, which were given over to princes little likely to build churches; and from that time until about the year 1830, little or nothing was done that is worth study or imitation.

In 1835, the church of St. Ludwig, in Munich, was built by the ex-king of Bavaria. The architect was Gärtner. The style is a kind of Romanesque. As this church was, perhaps, the very first attempt at a revival of ecclesiastical architecture in Germany, we must not criticise it too harshly, although some of its defects are of the most glaring description. Such as the want of a chancel or choir, the use of plaster instead of stone, the admixture of classical features in the details, &c. The church of St. Boniface, in the same city, was building at the same time; and the church of "Maria Hilf," in the suburb of Au, in the next year: this last is a Gothic church of large dimensions. The architect was Ohlmüller; and, whatever faults the building may possess, it was a great advance upon anything that had previously been done, and is, perhaps, the first specimen of a real Gothic church carried out in Germany. In 1842, a great impulse was given to the "revival" by the commencement of the works for finishing the cathedral of Cologne. The architect chosen was Zwirner, and the choice was a wise one; for, although possessed of little originality, he was one of those men who devote themselves heart and soul to the performance of any duty, instead of consulting his own taste or ideas. Zwirner devoted himself wholly to study what was the intention of the original architect; in fact, he looked upon himself merely as an instrument for carrying out the ideas of that great master; and it is a matter for congratulation that he did so. What makes that noble church so interesting is the fact that it is such a thorough link between the Middle Ages and modern times; it is the design of a thirteenth-century architect still being carried out, though nearly six centuries have passed since the drawings for it were made. How very few architects would have had the wisdom to sacrifice themselves as Zwirner did. September 2nd of this present year was the twenty-fifth anniversary of the laying of the foundation-stone for the completion of Cologne Cathedral, and on that day the finial was placed upon the canopy over the great western doorway. It may interest our readers to learn what has been done towards completing this noble edifice during the last twenty-five years. In order that they may realize the greatness of the undertaking we must describe the church as it existed in the year 1841. The great choir and aisles, the chapels surrounding the "*chevet*," the two northern aisles of the nave, and the sacristy, were the only portions of the building completed. The nave and two south aisles were carried up as high as the capitals of the great arcade, and covered with a temporary roof; two bays of the eastern wall of the north, and two bays of the eastern wall of the south, transept were built. The great south-west tower was carried to the height of 150 ft.; of the north-west tower there existed only the foundations, and the north-east buttress to the height of about 50 ft. This north-east buttress of the great northern tower was the latest portion of the old part of the cathedral; it will be seen by examining it that although it follows the general outline of the buttresses of the opposite tower, its detail is quite late Third Pointed. From this description it will be seen that about half the cathedral was built, and in this condition it had remained for about 350 years, during which period no work of any consequence was carried on in connexion with the church. The last archbishop but one first conceived the grand idea of finishing this noble building; but he did not live to see the work far advanced. His successor, however, brought great zeal and energy to bear upon the undertaking, and received considerable assistance from the kings of Prussia and Bavaria, but by far the greater portion of the money for this grand undertaking has been collected from private individuals by a society called the "Dombauverein." This society has branches all over Germany, and deserves the greatest praise for its zealous and disinterested exertions.

The first thing that it was found necessary to do in 1842 was entirely to restore the choir, both inside and outside. Then the foundations were laid for the west front; the south aisles were carried up to their full height, and the vaultings constructed. The next step was to raise the walls of the two transepts to a level with the aisles of the nave, and construct the arches of the six great doorways. After this followed the triforia over the nave and transepts. The whole building was then again covered with a temporary roof, which remained until the year 1863. During the eight or nine preceding years the works were carried on with great expedition,—the clearstories over the nave and aisles, the flying buttresses, and the great vaultings over the nave and transepts were constructed. In 1863 the temporary roofs were removed, and the whole of the interior of the cathedral, with the exception of the two bays of the nave between the towers, was completed. We are not aware whether Zwirner lived to see this glorious view; if he did it must have repaid him for his patience and self-sacrifice. We are sorry to have to find fault with any portion of so grand a work, and one carried out so conscientiously; but we cannot help expressing our opinion that the omission of the stone lantern over the "crossing," as shown in the original drawings, was a great mistake, and its loss is not compensated for by the stumpy and ungraceful *flèche* which occupies its place. What a pity it is that Zwirner did not reproduce or study the beautiful *flèches* at Amiens or Rheims, as the one he has erected at Cologne is simply a great *stone*-like pinnacle, executed in metal. Another feature which we must criticise, is the cresting which, like the *flèche*, is thoroughly unmetallic in character, and the design is more suited for a stone parapet than a metal "brattishing." The finials on the transept gables seem to us far too large, and have a heavy and clumsy appearance; and surely nothing can be more miserable and paltry than the new altar erected at the entrance to the choir, which looks as if it had been bought ready made at some upholsterer's shop. Since Zwirner's death, the chief works have been the raising of the north-west tower to the height of the south-west one, the turning of the arch and building the canopy over the great west doorway, and the grand terrace round the north and east sides of the cathedral. This terrace was opened to the public on the 2nd of September this year, and is really a very fine work, which adds greatly to the dignity of the exterior of the cathedral.

Internally we notice the two new windows at the ends of the transepts, which are very beautiful, and far more like old glass than most of the modern windows in this church. Four new statues, by Fuchs, of Cologne, have been placed against the large piers of the "crossing," and an altar has been erected in the eastern aisle of the south transept. The reredos of this altar, called the altar of St. Agilolphus, originally stood in the Church of S. Maria ad Gradus, which was destroyed at the commencement of the present century. The reredos consists of a triptich of large dimensions, raised upon a super-altar. When closed the valves are ornamented with a series of pictures, by a Flemish master, of the sixteenth century, representing the chief

events in the life of St. Agilolphus, and another saint. When the valves of the triptich are open, the reredos exhibits a series of niches, filled with small subjects, carved in wood. The whole is most elaborate and intricate, and is one of the most beautiful specimens of sixteenth-century carving in Germany. This magnificent work of art has been well restored, and forms a great ornament to the interior of the cathedral. Before leaving Cologne Cathedral, we must not omit to mention the new hangings which adorn the backs of the stalls; they are the work of the ladies of the city, and are thoroughly in keeping with the architecture of the building.

Another work of Zwirner's which we must mention is the church of St. Appolinarisburg, at Remagen. When we look at this church, we cannot feel too rejoiced that Zwirner did not indulge his own fancies at Cologne; for here, where he was unrestrained, he has produced a building which exhibits every fault possible in a church of its size: were it not for the glorious frescoes it contains, it would be difficult to find a more uninteresting building.

Contemporary with these works of Zwirner in Northern Germany, Heidloff was restoring the churches in Nuremberg and the cathedral at Bamberg. We cannot, however, give much praise to his works, as in many cases his restorations were extremely destructive. This was particularly the case at Bamberg, where several most splendid Cinque-cento monuments were removed out of the cathedral, and a very picturesque "*Passions bild*" destroyed. Of the new churches built from his designs, the less said the better. It is remarkable, but not singular, that a man who could write so ably about architecture, and draw so well, should fail so terribly in the practical part of his profession.

The restorations of the cathedrals of Ratisbon, Munich, Ulm, and Speyer all helped to further, for good or ill, the cause of the Revival. We must now mention a church which is, perhaps, one of the finest monuments of the nineteenth century, the new church of St. Nicholas, at Hamburg, by Mr. Scott. This is certainly the noblest church ever erected by Protestants in Germany. We shall not attempt to describe this building, as we are speaking of the work of German architects, and it has been illustrated in our pages; but we mention it on account of the influence which it has had upon the taste for Gothic architecture in Germany. It showed the Germans that there was nothing to prevent the erection of a cathedral in the nineteenth century that should be perfect in all its parts, and a rival of the grand works of former ages. The works of Pugin, which were read extensively in Germany, had also the same effect. The works of Heidloff, Gärtner, and Möller had thoroughly instructed the German mind upon the principles of Gothic architecture; but still there was something wanted; for, however well the theory might be understood, the buildings erected were either tame and spiritless reproductions of ancient ones, or mere wild and fanciful jumbles of all kinds of styles. This want has at length been supplied by two men, both, we believe, pupils of Zwirner, and educated architecturally in the workshops of Cologne Cathedral: we refer to Vincent Stadtz, of Cologne, and Professor Schmidt, of Vienna. Others have arisen round them who possess the same spirit, but we believe they were the first architects who ever built thoroughly good Gothic churches in Germany; and since they have set church architecture upon its proper footing, Germany has made immense progress in this art. We shall now speak of works at present in progress or recently finished, commencing by noticing some of the churches by Stadtz.

The church of St. Mauritius, at Cologne, of which we give an illustration,* is one of the finest modern Gothic buildings in Germany. It consists of a nave and aisle, large western tower, crowned with an octagon lantern and spire, over 200 ft. high; transepts, with apses and small apsidal chapels, a deep chancel terminating in an apse, and two apsidal chapels. The arrangement of the eastern portion of the church is singularly original and good. The apse is in two stories, and bears a slight resemblance to the east end of the cathedral at Ratisbon. The walls of the lower story of the apse are much thicker than those of the upper, and this gives internally a deep recess in front of each window. The angles between the transepts and chancel are filled up with two semi-octagon chapels, set obliquely between which is an octagon turret; the angles between the nave and the transepts are also occupied by octagon chapels, but there is only one on each side, the extra space being taken up by the aisles cutting into the transept. The interior of the church is very noble; the whole building is beautifully vaulted in brick, with stone ribs. The nave arches are rather narrow, and are supported upon very solid piers. Above the main arcade is a triforium, which is glazed in the apses only; and this accounts for the transom in the eastern windows, which is nothing more than the back arches of the triforium showing externally. This arrangement is precisely similar to that in Ratisbon, and has internally a very pretty effect. The clearstory is noble and lofty, and lighted with large three-light windows. The chapels in the angles between the transept and chancel have a very picturesque effect when seen internally. Most of the fittings are temporary; but two very good side altars have been done, and a pulpit of good design is in course of erection. The sacristy opens out of the south transept.

There is very little sculpture made use of throughout the building; but in the tympanum of the western doorway is an old fifteenth century rood and attendant figures in stone, and on the top of the spire is a statue of the patron saint in stone. This is, perhaps, the only feature in the whole building with which we have any great quarrel. The effect of a statue on the top of a spire is never satisfactory. We know it was occasionally done in the Middle Ages, as in the case of the Capella della Spina at Pisa, and the cathedral at Milan; but we do not know of any ancient example north of the Alps, and we cannot help thinking that M. Stadtz has ruined his spire by placing a statue at the top of it. To our mind, also, the spire has too many bands and lights in it, and would have looked better had it been kept more simple. However, we do not wish to criticise a building which is, on the whole, so extremely satisfactory. The length of the church is about 200 English feet; the width of transept about 120 ft. The material used is brick. The windows and dressings are of stone.

The next church we shall mention, and of which we publish a plan,* is the new cathedral of St. Mary, at Linz, on the Danube, also by M. Stadtz. This church was commenced in 1862, and will, when completed, be the largest modern church in Europe and the largest cathedral in Austria. At present, however, the crypt, the lady chapel, and foundations only are completed; but it is expected that the church will be ready for consecration by the year 1884. The lady chapel was opened for divine service in 1866. The following will be the dimensions of the church (in Vienna feet) when completed: — External length, 410 ft.; width across transept, 211 ft.; height, inclusive of external roof, 136 ft.; height to vaulting, 96 ft.; height to vaulting of aisles, 42 ft.; height of spire, 410 ft. The material being made use of is granite, with sandstone dressings. The church will consist of a nave and aisles, with a western tower, flanked by porches and two apsidal chapels, opening out of the aisles of the nave, deep transepts, a large choir, and aisles, surrounded by chapels; a lady chapel, sacristies, muniment room, and an extensive crypt, under the eastern portion of the choir, and lady chapel. The site on which this church is being built cost 300,000 florins.

The church at Euphen, by the same architect, is very similar to that of St. Mauritius at Cologne. It is, however, smaller. It consists of a western tower and spire, the design of which we prefer to the one at Cologne, a nave and aisles of three bays, transepts, and an eastern apse. The style is good Geometrical.

The churches at Kävlear, near Cleves, Höchensum, and several others in the neighbourhood of Cologne, are by the same architect; but our space does not admit of our giving a description of them. We shall carry on our observations in another article.

ANOTHER CITY CHURCH FOR SALE.—St. Mary Somerset, Thames-street, will be sold in the course of a few weeks, under "The Union of Benefices Act," and warehouses erected on the site which it at present occupies. Gilbert Ironside, D.D., warden of Wadham College, Oxford, who was Vice-Chancellor of the University in 1687, when James II. seized upon the venerable foundation of Magdalene College, and sent his commissioners to Oxford to expel the fellows, lies buried here.

* See p. 803.

See p. 802.

CIVIL ENGINEERING IN INDIA.*

THE civil engineer, who has been educated in England, and commences to practise in India, will find that there are many things he will have to learn over again from a different point of view, and large accessions to his stock of information and experience to be obtained before he can make a move. We are not airing a platitude in making this statement. The fact has been so forcibly impressed upon us after looking carefully through two new volumes, edited by the indefatigable president of the Thomason College, Roorkee, Major Medley, and coming face to face there with a realization of the difficulties and peculiarities that must be contended against in every-day practice in civil engineering in India, that we are fain to give note of it; although many a harassed cadet has, doubtless, arrived at the same conclusion before. Trains of loaded elephants; railways drawn by bullocks; ever-recurring need of sunshades and punkahs; mighty inundations sweeping all before them; immense trees imbedded in rivers to the great increase of the dangers of navigation; vast deposits of silt choking up canals and rivers; boat-bridges; constant liability to the inroads, attacks, and devastations of a seemingly inconsiderable, but in reality insidious enemy it is impossible to exterminate, the white ant, are but a few of the local novelties quite unconnected with the puzzling differences in the building materials available, which, of course, present a still more important study to be mastered. On the principle that those who are forewarned are forearmed, Major Medley's works should be well digested by all who are in training for Indian service, as well as by those who have commenced practice. In many respects, however, the basis of Indian experience must be home experience, and we perceive this deftly interwoven with much of the major's teaching. To give an instance of this dovetailing of experience, we may note that the decay of the ornamental tracery of many handsome buildings at Agra and Delhi, including the Kootub Minar, would not have been so easily accounted for if the Cathedral of Lichfield, and some of the colleges at Oxford, had not also furnished examples of the decay of stone, and the cause of the misfortune.

The building materials, as we have said, present a most formidable difference from those in use in England. There are 164 kinds of Indian woods bearing the most outlandish names, either in use for house-building, furniture, agricultural implements, &c., or worthy of being experimented upon for those purposes. Some of them are familiar to us by name, and by force of association stand out picturesquely and almost poetically from the list,—the date-palm, sandal-wood, tamarind, cocoa-nut palm, locust, lancewood, ebony, all suggestive of Indian scenery or Indian industry in rich carvings and cunning inlayings; but most of them convey nothing to those who do not hold the key of their meaning in the native tongue. Novices would be puzzled with specifications naming such woods as Odroopoo, kurroo-vangay, though this is but the Hindoo disguise of the sweet-smelling acacia, coorvee-allum, cush-mulla, jambo, keekur, kuddapah, mahwah, neichitte, peddowk, htouk-ghan, jedachoo, sissoo, tha-byew, thingan, thumbogum, tsheik-khyee, trincomallee, and the vomit-nut, which is the English name conferred, in Hindostan, upon the *strychnos nux-vomica*. The Burmese have noted the close grain of a large tree growing on the high hills between the Sitang and Salween rivers, and have called it Theetmin, the prince of trees; and in like manner these curious names we have culled as samples have their significations. Indian timber is, however, comparatively an easy subject to master in comparison with Indian stone. Although Major Medley intimates that there are but few records descriptive of the various building stones found in India, he runs through a minutely graphic list of upwards of fifty varieties of sandstone. Every colour of the rainbow is found in Indian sandstones. The Ainthi rock yields stone of a pinkish white, or ochreous yellow, barred or striped occasionally with black. Paraoh sandstone is white; that from Telri is of a dull blue-green colour, which turns to olive green after exposure; that quarried

* "The Roorkee Treatise on Civil Engineering in India." Edited by Major J. G. Medley, R.E., Assoc. Inst. C.E., Principal, Thomason Civil Engineering College, Roorkee. Printed and published at the Thomason College Press. Allahabad: Hill & Son. Calcutta: Thacker, Spink, & Co. Bombay: Thacker, Vining, & Co. Madras: Gantz, Brothers. London: Smith, Elder, & Co. 1867.

close to the Gwalior Residency is of a dull brownish red hue; Bamor quarry yields a dirty white stone; and Manpoor a dingy pink. Laterite is the rock most largely employed for building purposes wherever it is procurable, as in the Midnapore and Orissa districts. Cretaceous limestones are quarried for the construction of small village pagodas and chuttrums. The natives use gneiss for their temples; trap, quartzose, and greenstone rock for building and paving purposes; coral-reef limestones for their rice-mortars and water-troughs. English architects and engineers occasionally contrast one stone with another, as in the pavement of the Gwalior Residency, where squares of olive-green sandstone alternate with others of a brownish-red colour. When we come to bricks which are sun-dried and called kucha, or burnt and called pucha; tiles, which may be either pot tiles, pan tiles or flat tiles, flooring tiles, or drain tiles; limes, cements, mortars, concretes, and plasters, we come to just the same inconsiderable differences as we find in the tools and execution. Everywhere, of course, the amount of work performed by coolies and native horses is less than that easily executed by Europeans. A coolie labourer requires to be instructed in the use of the wheelbarrow, for hitherto a basket has been his only contrivance for carrying, and he does not care to dig more than 50 cubic feet a day. The force an English horse is calculated to exert when walking slowly on a level plain is about 120 lb.; but a native horse does not use more than 90 lb. An implement called a scoop is in much use here, as in America. This consists of an open box, like a hand-barrow, from which one side has been removed, leaving the bottom exposed. The edge of the bottom projects, and is sharpened, so, as the implement is dragged along, it scoops up the earth, and the three sides mentioned confine it for conveyance. A couple of bullocks or horses are attached to the scoop by means of chains or ropes, and a driver walking behind it guides it by means of a couple of handles affixed to the back of it. This implement is of no use, however, where the ground is not tolerably soft and loose.

In Indian railways there are many specialities. The greater part of the country being very flat, the gradients are very slight, and the tunnels very few. On the East Indian railway between Calcutta and Delhi, there is only one tunnel in a distance of 1,025 miles. This is the Monghyr tunnel, which is 900 ft. in length, and runs through an outlying ridge of the Vindhya range of hills, on a rising gradient of 1 in 500 up to within 75 ft. of the west face, where the gradient falls 1 in 500. On the Bhore Ghât incline there are, on the other hand, as many as twenty-six tunnels in a short run of thirteen miles. The white ants are a pest here as elsewhere, and have to be taken into account in the selection of sleepers and all timber work. The passenger traffic forms the most remunerative item in the receipts, although it was expected that the goods transit would have been the real source of profit. Major Medley divulges that it was laid down as a principle (when railways were first contemplated for India) that the great lines should be carried from end to end by the shortest and easiest routes, in the belief that it was the through traffic that must be looked to for profit rather than short local journeys; but, so far, the results tend to reverse this assumption, and to suggest that it is worth while to make very considerable detours to pick up the local traffic, as it is in reality more remunerative than any other. A ton of passengers, it might have been foreseen, though requiring no more haulage-power than a ton of goods, can afford to pay more for it than the competition, made by water-carriage and other transits, enables the directors to demand for goods. Short journeys in every-day life are more frequent than long ones; hence it follows that they should be well provided for in the laying out of a line to make it remunerative. A man may have occasion to visit the next town or station to that in which he resides several times a week, while he may, perhaps, never be obliged to proceed from one end of the line to the other. At Indian stations it is customary to provide verandahs, about 15 ft. wide, to extend the whole length of one platform, and waiting-sheds on the other; and a chubootra, well, and latrine for the use of third-class passengers, besides the ordinary waiting and retiring rooms. An Italian adaptation of Oriental architecture is the prevailing style used. Wells and bullock-runs are employed at some stations for the water supply of the tenders, and Persian wheels at others. All the arrangements for traffic, such as the number of trains, the hours of departure, and the tariff are made in concert with Government through the medium of the consulting-engineer. Before turning from Indian railways, with their dark-faced, turbaned attendants, shadowy stations, alternating with glaring lines through scorching plains, we may state on the authority of statistics, furnished to the Major, that the East Indian Railway on the 21st December, 1865, was stocked with 322 engines and 5,547 traffic vehicles of all sorts. As in England, the receipts from the intermediate and third-class passengers exceeded those of either the first or second class.

Horse-railways offer several advantages in districts where unlimited traffic cannot be hoped for, and accordingly they have been put in operation in India. Our hard-working Major has explored these advantages, and lends his countenance to the conclusion that, where cheapness of construction and working is of more consequence than speed, horse and cattle power may be advantageously substituted for the locomotive; though he advises that the possibility of an increase of traffic warranting the use of locomotives should be borne in mind, and that, as a rule, all lines should be so constructed up to the surface of the roadway as to admit of such a substitution, leaving the immediate difference of cost to be effected on the lighter kind of rolling-stock, the cheaper kind of station required, and the sharper curves and steeper grades allowable for low speeds. Sir William Denison, with special reference to a proposed horse-railway in the Madras Presidency, advises the employment of stone blocks as supports for the rails instead of timber sleepers, adding, that in many parts of the presidency, where the gneiss crops out to the surface, the stone block would be cheaper in first cost than any other sleeper, as well as more durable. Iron-pot sleepers, where stone is not procurable, are the next, in his esteem, for this purpose. An early experiment of cast-iron sleepers was made on the East-Indian Railway, for a length of about seventeen miles; but the road made by them was so rigid and bad, that they were taken up, and wooden ones substituted. A second experiment has been made with wrought iron, for a length of one mile, the result of which has not yet transpired. The Government bullock-train is another description of cattle conveyance with which India is furnished. As the daily journey of a bullock is averaged at ten miles, this mode of communication is no rival of the locomotive, except in the matter of cost. Captain Yule, writing of a projected cattle-draft railway in Rohilcund, ignores the expediency of making the road at the first in the substantial manner that would permit of the eventual use of the locomotive upon it, or of maintaining the gauge of the great railways, deeming that a great saving of expense would be made in the cost of wagons, works, and way, by the employment of a narrower gauge. His estimate for one mile of cattle-draught railway, including the necessary earth-works, sand and brick-ballast, timbers, cross-ties, spikes, laying way, rails, amounts to 15,923 rupees; and adding sidings, culverts, small bridges, large bridges, station buildings, fencing and gates, plant and wagons, runs up to a total of 26,500 rupees for the same distance.

Irrigating works must form a large section in an Indian engineer's practice, especially canals and tanks. A canal of the importance of the Ganges canal performs as much work as 300,000 men assisted by 1,200,000 bullocks could do. Well, irrigation also gives employment to the engineer to devise the means of raising the water, now usually performed by the *paecottah*, which is a lever with a bucket at one end, attached by a rope and a counterpoise at the other, worked by two men, the *môt*, which is a leathern bag, made from a whole ox-hide, raised from the well by two bullocks walking down a slope, and the Persian wheel, a cumbrous piece of machinery, also worked by bullocks. This mode of irrigation is inconsiderable in its results, compared to that effected by means of canals. Major Medley reminds us that the first canals opened out in India were those which had been made two or three hundred years ago, in the days of the Mahomedan Emperor, but which had been so neglected as to have become useless. These were repaired by the cheapest expedients, so as to bring them into working use again, without much reference to the true principles upon which such works should have been constructed. Little, indeed, was known of the laws of running canals until observation wrought them out. Sir P. Cautley, in prosecuting the construction of the Ganges canal, which was one of the first undertakings of the kind, made great accessions to the current information on the subject, which will be, of course, available in further works, although there are still important points that are yet open questions. There are two systems of canal irrigation now in use in the north and south of India, which are known as the Madras and Bengal systems. The first of these is chiefly confined to the deltas of great rivers, and consists of throwing a dam across the bed of a river to raise the surface level of the water to canals, whose mouths are above the dam, which conduct the water to the lands requiring it. It is only available where the adjacent lands are not above the level of the surface of the river. But as the beds of many rivers are highly charged with silt during the rains, and thus raised to the necessary height to make this mode of irrigation possible, many long strips of fertile country are watered in this fashion. The other system is by inundation. Cuts are made along the borders of the Punjab rivers, for a certain distance, and are then carried in directions parallel with the fall of the country. When the river floods, these cuts water the autumn crop. In the cold season, when the water is low, the cuts are dry, and they are of no use to the spring crops. As the waters subside, it is found that they have left a deposit of silt in the canals, varying from 1 ft. to 10 ft. in depth, and the opportunity the subsequent dryness presents is seized upon for an effectual cleansing. A large body of labourers is employed in removing the silt. Some of these canals are 300 years old, crooked, following every winding of the ground, but still in good working order, owing to this annual cleansing. Lieut.-col. Anderson, who has had considerable acquaintance with irrigating works, considers that one of the first points in the management of canals is to keep up the velocity of the waters. Any change of direction causes a certain loss. The slope of the main channel should be less than that of the branches, which in their turn should be less that of the minor channels and branches. By this means a uniform velocity will be maintained as far as possible, and the deposit of alluvial matter made as equal over the lands to be irrigated as is desirable. The snows of the Himalayas are in reality the great supply of some canals, as they feed the rivers in which the heads of them are fixed. From the necessity of fixing the source of supply high up on the river's course, so as to obtain plenty of command of level, that portion of a permanent canal near the head has to be built in a series of steps, down which the waters descend in falls. The first question is not, How much water do we want? so much as, How much water can we get? for, in Northern India especially, there is practically no limit to the amount of land requiring irrigation to prevent famines. It is not, however, considered economical to make the channel large enough to carry off the utmost quantity of water the river can spare when at its highest, for experience has proved that this extra water would only be available for one crop, from which there could not accrue sufficient profit to pay for the outlay on the extra size of the channel and masonry works. It is a singular fact that, though the minimum discharge of the Ganges is reckoned at 8,000 cubic feet per second at Hurdwar, where it leaves the hills, and the Ganges Canal is made to abstract 6,750 cubic feet, there is no perceptible diminution of the waters, nor is any interference with navigation felt. Each cubic foot per second of discharge is assumed to irrigate 218 acres. In the Soane Canal project, 1861, Colonel Dickens reckoned three-fourths of a cubic foot of water per second for every square mile of gross area. The Eastern Jumna Canal is found to irrigate 296 acres with each cubic foot; and in Madras, 40 acres of rice, or 100 acres of sugar, can be watered with the same discharge per second. But a new system is called for in the mode of payment. At present the area watered is the fact taken into account, not the amount of water used; and there is great waste.

The obstacle to an adjustment of this difficulty consists in the fact that no practical method has been devised for measuring water under a constantly varying pressure. Many things have to be contrived in the formation of these double-purposed canals. Some of the land through which they pass may be too swampy for irrigation; more may be reserved for forests, grass

preserves, or occupied by towns or cantonments: these tracts must be deducted from the sum total of acres to be watered. Major Medley puts the following case:—Suppose we desire to irrigate a particular district, say 200 miles long, averaging forty miles broad, lying between two rivers, by cutting a canal from one of them, and carrying it along the watershed of the country. The total area of such a district would be 8,000 square miles. Now of this our maps would show us (say) that 1,500 square miles were *khadir* land, which could be irrigated by wells, or by small canals cut from the river, leaving 6,500 square miles of *bangur* to be provided for, from which another 1,500 would very likely be deducted for town sites, swamps, forests, &c., leaving 5,000 square miles actually requiring irrigation. At the rate of 1 cubic foot per square mile, this would require a canal with a minimum discharge of 5,000 cubic feet per second.

Aqueducts are occasionally required. Of these the Solani aqueduct on the Ganges canal is a remarkable instance. The canal is carried across the valley of the Solani river on an earthen embankment two miles and a quarter long, raised to an average height of 16½ ft. above the country, having a base of 350 ft., and a breadth at top of 290 ft. On this embankment rise the banks of the canal, 30 ft. in width and 12 ft. in depth, lined with retaining walls formed in steps. The river itself is spanned by a masonry aqueduct 920 ft. long, having fifteen arches of 50 ft. span, and a clear water-way of 750 ft., dimensions which place it among the most remarkable works of its kind in the world. With so much solidity is the masonry executed that there is as much below the surface as there is visible above it. The piers are 10 ft. thick at the springing of the arches and 12½ ft. in height, and the side walls are 8 ft. thick and 12 ft. deep.

A tank is an artificial lake formed by an embankment, called in native speech a *bund*, thrown across a line of drainage or the gorge of a mountain-pass, so as to collect the waters on the upper side, whence they are distributed for irrigation by means of sluices and channels. Some valleys possess several of these tanks, the head of one being placed where the cultivation under that beyond it ceases; and a breach in one leads to a breach in all, if proper precautions are not taken. The conditions most favourable for the construction of tanks are a channel bringing down an ample supply of water to a broad expanse of nearly level land suitable for a bed, with a rocky foundation, and which has in its rear a tract of country slightly lower in its level, to permit of its irrigation through masonry sluices constructed in the embankment, and communicating with earthen channels leading to each field. It is also a matter of moment that water may be at hand for the use of the work and work-people; and that stone, lime, and fuel be also procurable. As all these facilities seldom present themselves in one spot, it remains for the engineer to make a selection of a site embracing as many of them as are to be found in one locality. This especially is a branch of engineering in which but little home experience can be brought to bear. And so again in the removal of kunkur banks and the blasting of large trees. We mention one example out of numbers given by our author of the removal of a tree. It lay 200 ft. from the banks of the river at a village called Chupree, where there was a depth of 20 ft. of water at the root, and a number of branches spreading out in various directions, which were taken in hand one after the other. The root and stem were broken by successive charges of 25 lb. to 50 lb. of powder, and then separated and dragged to shore by crab capstans, but this was not effected till 850 lb. of powder had been expended. The root spread out in irregular masses to a diameter of 20 ft. facing the current, and was only demolished piece by piece, after having had several cylinders broken in the attack upon it. Such details as these given by Major Medley afford vivid pictures of the difference between Indian and home practice.

CROOK (DURHAM).—The foundation-stone of a Mechanics' Institute has been laid at Crook, by Mr. J. W. Pease, M.P. A large number of influential gentlemen were present. The site of the building—the largest room of which will seat between 500 and 600 persons—is situated at the end of Victoria-street. The building will cost between 800*l.* and 1,000*l.*

A MARKET FOR LONDON.

ARE the people of this mighty kingdom of houses, called the metropolis, ever to have a market worthy of them and of it; and, if not, why not? Is it not a reproach to the public spirit of the age and its boasted intelligence, that there is not, within a radius line of four miles from Charing-cross, or from the cross of St. Paul's, any thing fit to be called a market for retail produce? Are we for ever to be dependent on the mind-gauge of some private individual or other for our provision "exchanges?" What is the reason that Londoners, the knowing, the "go-a-head," the keen, the wealthy, the "hang-the-cost," are stolidly content with markets that comparatively poor, struggling, third-rate towns would blush for?

The markets that we want the most are what may be called kitchen-markets; places where we may buy that which is to grow muscle and bone for us, and enable us to feast and make merry. Man is a wonderful-eating and drinking animal, and, as he possesses, and lords it over the genii of the "sacred" fire, the provision market is an important spot of land for him. As the ancient philosopher said to the would-be student: "If ye know not geometry, then ye are not yet on even the very threshold of knowledge;" we say, that if ye know not marketing ye are not yet on even the very threshold of civilisation. There is, however, an old saying that "when things are at the worst, if they move at all they must mend." That saying has been, and is being, exemplified a little among us. Miss Burdett Coutts is busy with the market-redemption of Bethnal-green and the east, and the Corporation of the City have, after much trouble and popular pressure, taken the centre of London City in hand. Leadenhall and Newgate are doomed, and a great meat-market will take their place.

Our list of markets on paper looks formidable enough, and deceives the stranger; in fact, many of them are like mock auctions,—downright shams. To begin with, there is a book description of them before us, by which, were we merely a sojourner, we should certainly be taken in. There is Bloomsbury Market described as "for the sale of provisions generally." Now, we have lived in London a long, long time, many a year agone, but we never remember anything approaching to a market in Bloomsbury; we might just as well look for the green pastures and waving meads of St. Giles's-in-the-Fields as try to find a market in that locality. There is a decent-looking butcher's shop and the combinations of greengrocer and coal-shed standing *vis-à-vis* at the corner of a court to represent a market; yet none of the guide-books seem to have become aware of that fact. Bloomsbury "Market" is a kind of yard-street, of about 50 ft. in length and 25 ft. wide. It lies parallel between the High Holborn junction of New Oxford-street and Hart-street, Bloomsbury-square. A continuation of it, under another name, runs under an archway into Southampton-street. It is much patronized by the flying exiles of the neighbouring Seven Dials, who resort there to toss and gamble, during divine service on the Sunday morning. Then, again, we have "Brooke's Market," at the end of Brooke-street, Holborn, and, with the prolonging street leading you into Leather-lane. Here, another Guide to London speaks of "the sale of provisions generally." We have been in Brooke's Market many times during the last five-and-twenty years, and even very lately, and the only "provisions" we ever saw were those for dogs and cats. We believe there are the usual coal-shed and potato-bin; but whatever else there may be, there is certainly nothing approaching a market, save the name. The locality has an historical association, and is making a second one.

It was in the garret of a house at the end of Brooke-street, within sight of the market, that the unfortunate Chatterton transmitted his name to posterity as the literary boy-suicide of 1770. The second association is in connexion with a prominent church erected within the last few years; but as it has more to do with Ritualistic Commissions and Pan-Anglican Synods than with our subject, we will pass it by. The population of Brooke-street and the adjacent market has altered greatly of late. Those fragile-ware shops, kept chiefly by the children of Italy, in whose windows mysteriously-marked glass-tubing attracts the curious visitor, have broken out wherever a break-out has been possible. There are a great many courts that have burrow-runs from all sides of the market. They lead into other courts, that lead again into Gray's Inn-lane and Leather-lane, and the population is such as may be expected among such human warrens, under a system that has compelled the needy, ignorant poor, to lodge and bring themselves up, generation upon generation, after the fashion of their own unbridled, animal instincts, and that is all about Brooke's Market.

The next of these shams is Clare Market, neither more nor less than a gutter market, with stalls of fish, fruit, and vegetables, which, however, "handy" to the residents, has no pretension to be called a market. It is something like Strutton-ground, Westminster, a mere collection along the curb-stone of costermongers' barrows. Then there is Newport Market, which is composed of a long, narrow alley, a kind of "6-feet" passage, with butchers' shops on each side. On Saturday nights it is somewhat crowded, but there is no competition, as the butchers settle the prices in the morning, when they arrive from the wholesale markets of Newgate and Leadenhall. At the very best it is a most unsuitable place to be dignified with the name of a market. We go towards Soho, and come upon what is known by the name of Carnaby Market, near to Broad-street, Golden-square. It is difficult to imagine how such places came to be gravely put into print as "markets." The Metropolitan Board of Works might step in here with a series of re-christenings.

Going still further westward, we come upon another of these puny "markets." Turning Whitehorse-street, Piccadilly, there is Shepherd's Market,—that elysium of retirement for prudent footmen and upper-housemaids into the genteel chandler's shop or greengrocery business. But you have only to look round the 200 ft. of street-ing, its high-life-below-stairs atmosphere, to discover that "market" is a sad misnomer.

Continuing our course, there is Mortimer Market,—a small huckster-shop-looking place near Tottenham-court-road, with not a single feature to suggest a market. Then there is Fitzroy Market, also, by Tottenham-court-road, entered by a court from the street. It seems to consist of shut-up, ruined, slum-looking shops, cats'-meat stalls, marine-store dens, and old-furniture brokers. We had almost omitted a most humble-looking place, by the upper end of Oxford-street, called by the mighty title of "St. George:" it would puzzle a keen observer to discover what part of it constituted a market.

Again, we have Oxford Market, on the north side of Oxford-street. It seems to have been originally intended for a market "by construction;" but there the resemblance ends. It is half unoccupied, and the remainder is taken up by street-shops of a very crampy-looking kind, with nothing of the market character about them. Portland Market, Paddington, is quite a different affair. Although not fully tenanted, it has all the characteristics of the market proper. The Borough Market, too, in Southwark, is a regular market, at which a large business is done every week. It is chiefly noted for potatoes; but there are well-stocked shops for all kinds of provisions. Cumberland Market, Regent's Park, is chiefly a stablemen's market for hay and straw. Farringdon Market, at the foot of Holborn-hill, is mainly kept up by the sale of water-cress; otherwise it is a failure. We go on further into the City, and we find Honey-lane Market, on the north back of Cheapside. It consists of a butcher's, fishmonger's, and shoemaker's shops, the City of London School in the centre, the back entrances to some warehouses, and a "public" or two. Hoxton Market is "nowhere;" whilst Finsbury Market, in its deserted, tumble-down state, stands another witness to the folly that planned the sites and forms of these departed markets. Spitalfields Market is an extensive and a useful one, and Whitechapel, with its well-stocked butcher's meat and provision shops, offers a chance and a choice to the marketing housewife, should she venture out.

Of those small markets that are the more immediate objects of our present remarks, it may be asked, Why have they proved such failures? The answer is not far to seek, and, in giving it, we may ask another question:—Why were markets of such descriptions put in such places? Any market for provisions of a retail character of trade ought to be in the leading street of the district, having the whole of its interior open to the street, and not closed in by a curtain of shops. Look at Farringdon Market. Had that market been placed on the site of the Fleet Prison, where there was plenty of level

ground for all purposes, it would have presented a very different appearance, and have told a very different financial tale to-day. Our plan would have been to have had it quite open along its entire frontage, except some dwarf railings for police purposes. Then all could see it and be invited to enter as they passed along. It would have been well lighted everywhere, and that is a great point; for nothing is so depressing or deterrent to trade as a half-lighted, gloomy shop or market. Then, again, the market-carts could have driven in easily and unloaded, and the market would have been busy and popular. But what was done? The market was put on the side of a very steep hill, up which no fully-laden horse could possibly climb.

Then, as if to put the thorough extinguisher on the possibility of transacting business or drawing custom, a long curtain of shops was allowed to close in the whole line of front towards Farringdon-street, and the market proper was over-weighted and killed—at least not killed quite, but chloroformed into a state of stupor that has paralysed it to this day. *Facilis descensus Averni*, it is true, *sed revocare gradum* is not so difficult in this case as in the one put by Virgil. There is time, even yet, to make Farringdon a useful, thriving, popular market. Clear that unsightly curtain of shops, and bring the market down to the very edge of the pavement; have it all open, that it may see and be seen; make the cart-entrances all on the lower level of the street; secure land for extension northwards; then, with two levels, we might venture to stake the pen we write with that Farringdon Market, under the shadow of the new viaduct, and with these improvements, would put flesh on its starved, skin-cutting bones, and grow fat, prosperous, and happy.

With respect to the small retail markets, such as those we have previously enumerated, and whose resuscitation may be very desirable, the only successful way is to place them openly in the "high street" of the place; let them be convenient and low-rented, easy of occupation by everybody, and then rigorously sweep away street-stalls of every kind and degree, whether on wheels or otherwise. A retail market, properly regulated and inspected, ought to be a great guarantee to its locality. If unfit food of every kind were turned out of it with punishment, sharp and sure to the seller, and no possibility of costermongering it about the streets, the public health would gain largely. Make the market fair and reasonable; and, having done so, force every dealer into it, or mercilessly "wipe him out" of street-hawking as an act of public safety.

Look at Billingsgate. Can any one understand why three millions of people put up with the cost, inconvenience, and monopoly of a fish-market not much bigger than a good-sized jobbing carpenter's shop? It seems a marvel; but there is the fact. Three millions of people whose eternal throat-splitting cry is,—"Local self-government and no surrender,"—allow their fish, gathered from the waters of every sea, to be sent down to Billingsgate, in order that tax and toll may increase the price of the already too dear finny food! We ought to have large, unfettered, well-supplied fish-markets, east, west, north, and south of Charing-cross, the modern centre of London. Why, even Paris has a fish-market ten acres in extent.

Let us turn now to its vegetable counterpart, the ancient market of Covent Garden. What do we find there? Why, that the market proper has now become only the centre of the market of business. On each market morning,—Tuesday, Thursday, and Saturday,—the laden carts, wagons, greengrocers' "traps," and costermongers' barrows completely block up, and make morn hideous with their shouting, yelling, and imprecations in every street from the Strand to Long-acre, and from Drury-lane to St. Martin's. Here, again, is a curious phase of modern London character. Covent Garden has been, for generations, the chief fruit and vegetable market of the metropolis. It has altered little in size, at any rate, since 1830, when the present market buildings arose, at an expenditure of 50,000*l*., under the superintendence of the late Mr. Chas. Fowler; the space has not grown with the growth of the people. A few years ago, a clearance was made at the south-eastern angle for flowers and roots, but this is like enlarging an estate by pulling down an out-house or two; but the market is still far too small, and, what is more, and what is worse, the "Bedford people" are at their wits' ends about "room, room," being made a leading cry of public opinion; because, when that comes to pass, the market must "move on." Yet, there it is, and the same three millions of people before mentioned, with their battalion array of borough members and of county members in Parliament, with their vestries, their chief boards and district boards of works, and other things, and all their trumpeting and shouting about their power and their greatness, are content to have their principal market of this kind in a small crowded-in square, the property and tax and toll of a private owner.

Now, there is no enlargement, practicable, of Covent Garden Market on its present site; the cost would be enormous. Let us take, even, the most moderate extension to clear the ground. Begin at the right-hand corner of the Long-acre end of Bow-street, and walk down to the corner of Tavistock-street, then along to the corner of Bedford-street, turn up to the right to Long-acre, and on, again, to our starting-point. Nothing on a smaller scale would make a "good job" of it; yet does not the immense value of the property immediately brand the whole scheme as impracticable? The rebuilding of Covent Garden Theatre on the site of the old house was a fatal mistake, so far as the enlargement of the market was concerned, and so it is felt to be. But for the reconstruction of the theatre there was just the probable speculation that the market might have expanded eastward to the Bow-street line; the more especially as the police-court is to be removed over the way when the present lease expires in a couple of years or so. With that space thrown in from Tavistock-street corner to Hart-street, and on to James-street, a stop-gap might possibly have been found for the next ten years, but for no longer. A population that sweeps the farthest market-gardens of England for its earth-grown edibles, and then scours the continent of Europe, extending even to the fruitful fields of Algeria, is not likely to remain much longer contented with a stable-yard area for its principal centre of distribution, nor to let that centre continue in a private hand.

Old historic associations and memories are fast fading away from us before the flood-light of modern "improvements." We have mentioned the removal of the Bow-street Police-court in a few more years. It is intended to place it beside the present station-house, extending backwards, and then turning at right angles and debouching upon what was Little Russell-street — now Russell-street only—opposite the colonnade of Drury-lane Theatre. At this moment may be seen an indication of the proposed change in the newly-built entrance-front surmounted by the royal arms, now serving as a temporary builder's yard, opposite the pit-door.

Amongst the places doomed to be swept away is one old memory dear to the histrionic heart of a by-gone time. This is the Harp Tavern, Russell-street—the old "O. P. and P. S. House" of a former generation standing next door to the place just named. Up by the side of it is a gateway leading to a livery-stable yard, and as all are scheduled for the new court, the days of the tuneful Harp are numbered; so, whilst we have the opportunity, let us place on record some incidents connected with its history. If we mistake not, it has been in one family connexion for nearly a century; amongst the "noted" houses for the sale of "pure malt and hop," it has always been noted; and, even in the present age of shameless and wholesale adulteration, it has not degenerated, if we are to believe some half-dozen certificates of Dr. Hassall.

The Harp is an old house. The yard was taken in and a square cottage built upon it, the ground-floor being the parlour of the tavern. It is the associations of this parlour that have helped to make the house famous. In times when actors lived on the battle-field of the drama the Harp parlour was one of their evening rendezvous both for song and supper. When the great Edmund Kean came out at Drury-lane, in 1814, he often refreshed himself at this hostelry, and amused the company, who were all, more or less, of the theatre, with his favourite song of "Lord Allen's Daughter." There is, now, a cast of his face over the seat where he formerly sat, and a suitable tablet recording that circumstance. The walls are covered with portraits of actors and actresses whose name are landmarks to the English stage. Many a

> "Poor player
> Who struts and frets his hour upon the stage,"

and who has long since

> "Shuffled off this mortal coil,"

has found substantial aid in that parlour before he became famous. It was round one of its tables, too, that the flourishing "Society of Buffaloes," which now numbers thousands of branches, was formed.

There is still a curious social institution upheld there, called "The Ancient and Honourable City of Lushington," that, strange to say, claims to be the oldest temperance society in the world. But to go into an account of this curious association would lead us too far out of our way.

To return to the main subject. The question of market accommodation must soon force itself upon the governing powers of the metropolis and upon Parliament. To say that the great west-central market area can remain as it is, because it happens to belong to a powerful nobleman, is to say that Covent Garden must stand still whilst all the rest of the world progresses. The next inquiry is,—What is best to be done? Turn whichever way we will the prospect of expense is fearful. Suppose we were to buy the Duke of Bedford out, in what direction should we move? The cheapest way would be towards Bedford-street, by removing the church and the contents of the churchyard, and taking in the enclosing sides of Henrietta, Bedford, and King streets. This would give us double the present market area. Then we might at the eastern end push into Bow-street as far as the theatre would allow us. Here is the only palliative we can apply on the present site. The cry is still "Room, room, room!" and there is no room to give. The consequence is that a general choke up and corresponding nuisance take place every market morning, from an early hour in all the surrounding streets. Surely this can never be allowed to continue,—that, for the special benefit of an individual market proprietor, the whole of the adjacent thoroughfares shall be taken up by his market-paying customers to the inconvenience of the general public. To work our way into Long-acre would be too costly; but we might take the block from Evans's Hotel and throw ourselves in the same direction; whilst on the south side we might get into Tavistock-street and Maiden-lane. Our readers will now see the difficulty that enwraps the subject, and, we believe, the anxiety of the Bedford office about it is no secret.

But is this the best we can do? Let us look round and see.

If we commence at the corner of Endell-street, Broad-street, St. Giles's, and go south to Castle-street, then, still keeping to the right hand, pass down Castle-street, we come to the top of St. Martin's-lane. We then continue our course up West-street, and Crown-street, to its junction with Denmark-street, by which we reach St. Giles's Church, and down Broad-street to the corner of Endell-street, our starting-point. In this tour we take the boundary-line of what is called "The Seven Dials." This will comprise an area about equal to that from Bedford-street to Bow-street, and from Long-acre to Maiden-lane, amounting to three times the length and three times the breadth of the present Covent-garden Market, and twice as large as Old Smithfield. This is the place in which a great metropolitan market could be planted. The streets of the Seven Dials are all "slums," and the lower strata of the inhabitants are composed chiefly of the dangerous classes. The place is like a rabbit warren, all cut up into courts and alleys. Who that has seen the cellar-dwellings of Monmouth-street, to which place the old, notorious "Field-lane seems to have emigrated, cannot confirm what we say? All the property required within this extensive boundary is of a poor description. A thorough clearing away would purify the social and moral atmosphere of that part of the town. The next problem, of dealing with the dispossessed people, is one that is capable of solution hereafter: it would be too extensive for discussion in the present paper.

Now, let us look at the advantages of site of our market in such a situation. In the first place that long, much-wanted improvement, the continuation of Tottenham-court-road, by the western end of St. Giles's Church, to the top of St. Martin's-lane, could be carried out along the western line of the market boundary. By this means all the western and north-western traffic for the market could enter its gates at once by New Oxford-street, and Tottenham-court-road. Hammersmith, Fulham, Putney, and Brompton, could come along Piccadilly, and enter by the southern gates, whilst the eastern ones, opening upon Broad-street, St. Giles's, and

the south-eastern upon Endell-street, Long-acre, would admit of all that came that way. Nor would this space, large as it undoubtedly is, be too large.

In a comprehensive, self-contained chief market of that kind for London, it must be borne in mind, that room would be wanted for bait stabling to a large extent, and warehouse space for the necessary fodder. Besides, stores would be required for large consignments of fruit, potatoes, and other root edibles, in passing from grower to consumer. Provision must also be made for the sale of dairy produce as well. It is not everybody who will care to go to Smithfield for a turkey, or a pair of fowls, or fresh dairy butter. In such a market sufficient space would exist for the breaking of bulk, and the transfer of loads; the moving about of carts and wagons; the ingress and egress of railway vans from all points of the compass, and the proper supervision, control, and refreshment, of both man and horse. Classification of either districts or goods could be carried out to the greatest attainable perfection; there would furthermore be no crush, no crowding of adjacent thoroughfares, no shivering horses in the by-streets, and no confusion; laden vehicles could be emptied upon arrival, and their loads stacked for sale, when they could draw off to the stabling side of the market that would be set apart for their use. Here we could have entrances on all sides of the great arterial thoroughfares of the metropolis,—the eastern and south-eastern by the top of Bow-street, to the next corner of Endell-street; the south, the same way from over Waterloo Bridge; the south-western, by Piccadilly and St. Martin's-lane; the western and north-western, by Oxford-street and Tottenham-court-road; and the northern and north-eastern, by New Oxford-street and Broad-street. Compare such a market as this would be with the present coal-shed and greengrocer kind of affair. In the new market both sunshine and shelter could be at the optional choice of everybody and for everything, and nothing need be left undone or uncared for.

OUR DEVONSHIRE VILLAGE.

Our Devonshire village is really a remarkable landmark on the map of England. Its scenery, its houses, its people, manners, and customs, are all fit for a novelist's pen or a painter's pencil; and yet, with all, its name sounds harsh. Boasting in all that is romantic, its name is as ungenteel as could be. Glorying in the name of Beer, its fame is not imaginary, for, cloaked with the grandeur of nature, it is surrounded, too, by an army of workers as busy as bees, who produce for our West-End worthies the elegant Honiton lace; and there is hardly a lady whose laced shoulders grace the "drawing-room" or "evening party" who knows what a charming and romantic district is that which produced her delicate covering.

It was the love of rambling, with the assistance of the travellers' friend, Murray, that caused our being introduced to this Devonshire village, one of if not the most romantic on the English coast. We had already commenced our tour along the South Devon coast, had taken our rest at several villages on our way, had enjoyed the borders of Dorset, the beauties of Lyme, had narrowly escaped a fall of 200 ft. in the great Pinney landslips,—a grand and solitary region, where gaunt cliffs and dense copse, craggy pinnacles and Mistress Echo lend enchantment to the scene;—we had passed through Axmouth and Seaton, and along the coast hereabouts is a pleasant, as well as a dangerous ramble; but, when we cross White-cliff, called by Murray a "bluff, picturesque headland," we are eye-witness to a scene which well repays us for the venture.

From above we look down upon "Our Village" in the valley, and truly it is a picturesque view. A single street of small cob-houses has a rapid winding descent towards the shore. The background is enlivened by clusters of trees. In the centre of the village is its curious small shaped church; and down the street runs an open stream of clear spring-water. Rising in the hills above, and augmented by other springs on its route, its velocity is so great that at the foot a pretty cascade empties it into the sea. On our left a corn-field runs to the edge of a cliff, and from this another view is obtained. While the foreground shows houses amidst the clustering boughs of many a good-aged tree, and the merry laugh is heard deep down in the valley beneath us, we see the ocean sending forth its glistening waves, contrasting admirably with the stone, the chalk, and the green bushes and landscape which meet our view further west across the South-down Common. And on the edge, bounded by the sea on one side, and the rising ground on the other, we notice Beer-head, and while admiring this ivy-hung promontory of the lower chalk, we see before us the last chalk cliff in England.

It was a Sunday evening when we made our descent, and never did a village look happier. The cottagers, principally fishermen, were holding their evening converse with their wives, their children, and their neighbours, while the young girls, released from a week's lace manufacture, were taking their evening stroll down the highway or across the cliffs. And how the eyes of many of our London friends would have opened had they seen the gorgeous lace shawls which covered the shoulders of the majority of these Devonshire village beauties, who, reared humbly yet respectably, are not too proud to accept the title of "Dumplings," so healthy and well do they look. Of course the appearance of strangers was a signal for a village ovation. Every eye was turned, our features scanned, and inquiries daily made, and it is not too much to say that within a very short time after, who and what we were formed the leader of their "latest intelligence." And even this was lucky, for we were thrown into the society of a worthy fisherman, boasting in the name of William Good, whose life has been spent here, and who, bearing the character of a free and sincere adviser to his neighbours, was not the whit less courteous to ourselves. It was his lively conversation, and really useful knowledge, that assisted to bind us to the place, and to him our thanks are due for many expressions of goodwill and kindly advice while on our ramble.

Our Devonshire village has not changed much this century, for it likes not new faces. The same cob houses stand that stood in the days of the residents' ancestors, and but a very few indeed have given place to rebuilding. Still it must be supposed the buildings are sufficient for its population—a reality sadly against the village; and it must be owned that the value of the property in rentals, ranging from two to six pounds, is detrimental to its participation in the great reform, long wanted, and hardly as yet awakened. The clear spring watercourse still runs through the village, as it did in the days of our forefathers, and though its course was contracted into a narrower channel some twenty years since, and it now forms an open sewer, yet it is ever clear, ever sparkling, and to the stream is to be attributed the health the villagers enjoy. Two conduits, erected in the street, give a "constant supply" of spring water, and the Lord of the Manor, the Hon. Mark Rolle, has already commenced other works to improve this luxury—a luxury which East London would indeed have worshipped in the last cholera year. The velocity, too, of this merry stream is so great, that anything put into its course at the top of the village would reach the sea within but a very few minutes. So curious, indeed, did this freak of nature appear to us, that we still have before us a vivid view, and we can still in imagination see it merrily capering towards its ocean bed. And while the stream runs merrily on, while we walked along the pebbled path, we can yet see another sight, for the very grass grows beneath your feet, and ducks and geese trot about, taking little heed, and having little thought whether it be a village green or the Queen's highway.

At the upper end of the village are the schools and almshouses founded in 1820 by Baroness Rolle, whose liberality finds much praise in this part of the county, while a little farther on is the newly laid-out cemetery, which, to save the villagers carrying their deceased friends to Seaton, the Hon. Mark Rolle has, at an expense of 1,200*l.*, considerately given them. And let me not forget to mention another benefactor to the village, a Mr. Williams, of the Isle of Wight, who, having occasionally visited here, and noticed how difficult it was to get the fishing-boats on shore on their return from trawling, presented the fishermen with a capstan, which proves to be a great friend indeed to them.

But if the village is bright in the summer's sun, it is not so when the darkness of winter makes all look grim. When the shades fall, and the moon is far away, few can picture the scene. And when, three winters since, brackets for the lamps were fixed in the walls, many there thought a great reform had come at last, that a good genius had been at work, and his deeds had but just been brought to light; yet curious still is the aspect, for along the single street, with the rushing waters beneath, and perhaps the stormy element raging above, the only light to be seen in this romantic valley is the strange flicker of a candle, or the but little better illumination from paraffine.

In the bay by Beer-head, the natural formation of the rocks presents one of the most favourable opportunities for the making of a harbour; and such a plan has been, I believe, some time in existence. Now Beer-head, called by the fishermen Berry-wold, is another curiosity, remarkable for its two natural towers of chalk, not to mention the ivy-clad appearance which gives a particular character to the scene. Looking up from the beach, and surrounded by the great cliff in this rugged cove, there is a certain enchantment lent which no words can here repay. And even while we see all this around us, while our minds become mixed up with retrospective glances and present-day experiences, other sights come to our gaze, and we recollect that the celebrated Beer quarry is worthy of a visit.

Beer quarry, about a mile up the road from the village, produces a most valuable stone, which for three centuries or more has been worked here. It is in two divisions, the old and the new. The old one, the stone of which is much softer, has not been worked for many years, but the new one is now supplying stone for many great improvements, not only in the neighbourhood but at a distance, including the cathedral at Exeter; and, should a railway be made from here, and a harbour formed, this quarry will tend to raise our village to no small eminence in the history of these parts. Occupying, as already worked, about eight acres, it is at present held by Mr. Mirch, of Colyton, who, from what we could see, would do well to infuse more spirit into the work by a company or otherwise. Arriving at the entrance, low, gloomy, and forbidding, we shout as we had been directed, and in the distance is heard the echo. Soon we see a candle flicker, and a quarryman is duly introduced to our notice, We ask his name, and he answers, John Cowley. He commenced his work here so long ago as the 13th of November, 1825, while a mate of his, a James Tucker, who died two years since, dated his apprenticeship from 1807, showing that life, though thus confined, can exist in the deep recesses of a free-stone quarry.

It was then with this guide,—and "bad luck" to him who would venture into the labyrinths without one,—we entered the cavern and surveyed its precincts. And a wonderful sight it was, consisting of beds of freestone, lying at the junction of the chalk with the green sand, being principally composed of carbonate of lime, soft and easy to work, but hardening on exposure from the evaporation of the water it contains. You here see the huge blocks cut and removed by a single quarryman. These caverns are rendered, too, more imposing from the fact of the square pillars of stone left standing in order to support the roof; and which pillars are huge blocks, 18 ft. long, 7 ft. wide, and rising to the height of 14 ft., for the stone is generally constituted in layers of seven beds, and not higher. And when it is recollected that these deep recesses in the earth are under the rising ground in parts 300 ft. from the surface, it naturally excites our astonishment that falls in do not often occur—the last of any consequence taking place half a century ago. And far into the interior of the darkness—for our only light was a small and remarkably thin candle—are some curious nooks pointed out. Here, in a narrow compass, far underground, may be seen the remains of the Smugglers' Cave; here Jack Rattenbury, the bold smuggler of the Devonshire coast, kept his court, among the smuggled spirits; here existed—does exist still—the chamber wherein law was defied, and strange scenes enacted. Jack Rattenbury left this world some fifteen years since.

As already stated, the inhabitants of our village are for the most part a fishing population. The fathers employ their time in mending their nets at home, or casting their lines abroad upon the sea, for the distance of about ten miles from shore. Out with the early birds at two or three in the morning, they seldom return until the day has far advanced. Of course, the village is not great in fishing repute, but it is well known round the coast that the Beer boats are large and strong, and that the men bear the general character of being honest, sober, and industrious.

Some have other trades besides a dependence on fishing, and well for them that they have; for, when rough weather sets in, they would stand poor chance against the sea off Beerhead. The boats are twenty-three in number, of which seventeen are trawlers and six are employed in catching lobsters and crabs.

When your morning stroll is taken, when you return from a lounge at Seaton or a ramble over the South Downs, you take a turn to the beach, narrow and limited as it is; you watch a little speck in the distance; you see it approach nearer and nearer; you perceive a sail, and, waiting patiently, one of the long-looked-for boats runs to shore. Already have the buyers arrived; already we see excitement; and when the fish is landed, the Dutch auction held, and the haul sold for, say, 8s., 10s., or 20s., or even less than the lowest of these sums, the fish is soon hurried away to be retailed some miles inland. And, as each little sail makes a run for shore with her fresh cargo,—or none at all,—the produce of the briny deep, a continual excitement is kept up on this usually quiet beach for several hours. But the fish caught off here seldom, if ever, enter the London market; the consumptive powers of nearer cities claim the produce for themselves.

The housewives of Beer appear industrious, while the girls form parcel of the great lace manufacturing district, which though bearing the name of Honiton, is at least ten miles around it. Of course we have heard of Honiton lace; our lady friends have justly prized it from the time the Lollards introduced it in the reign of "Good Queen Bess," but we fear our fair friends of the West end little imagine that the earnings of those that manufacture it, do not reach to more than from 4s. to 6s. per week. How often do we close our eyes to the actual pay for labour in this country, when bent on enjoying its proceeds. This makes our girls marry early, and often leads them to a life of misery. Then they leave the village, and as often their ambition is to go to London, to the great metropolis they come.

The young men, too, of Beer seek their fortune, and many find employment in the great City houses, seldom forgetting, however, their native village. And as for the children, they all take early to the water, are good swimmers, and death by drowning here is rarely heard of.

But if our village is a model in one way, it is equally so in another. If the character of its buildings tend to tell us that Beer loves old associations, so the character of its people proves that all live in good fellowship with all men. It boasts not of the assembly,—

> "Where village statesmen talk'd with looks profound,
> And news much older than their ale went round."

It aims at a higher mark of distinction. In trouble, in sickness, or in health, the love of mischief is a prohibited pastime. Curiosity is at all times allowable, and Mrs. Gamp and Mrs. Partington are not ladies to be easily "put down" in this age of ours, but the horrors of scandal-mongering, as detestable a crime as a fellow-creature can commit, are in this village a name, but no reality. Woe to those that do scandal at Beer! Would we could say as much for all other villages.

But what will be thought when I state they have neither a doctor, a lawyer, nor a parson amongst them? The inhabitants say they nurse their own sick, and can well plead for themselves. As for the parson, he resides at Seaton, about two miles distant. Again, ever ready to help each other, a "Volunteer Life Brigade" has been formed: it now musters 68 strong and active men embodied to protect their homes and families, and what was once a hotbed for smuggling is now the haunt of law-loving Englishmen.

Such, then, briefly, are the appearance and customs of our little village,—as romantic in realities as any village could be. And yet it is not alone: it is surrounded by others noted in more ways than one, and places of interest to us all. We have on the west the straggling village of Branscombe, picturesquely situated between three hills, one of which is 600 ft. high. At Branscombe, the workpeople of the late Mr. Tucker (the principal lace-merchant in the county) turned out, in 1839, the Queen's wedding dress, and here was produced for the Exhibition of 1851 a marvellous specimen of the art, value 3,000*l*. Beyond lie interesting and lofty cliffs, with their Weston-mouth, romantic little dell; Sutcombe Regis, once a fort, the last in the county to hold out for King Charles; and two miles farther is the much-vaunted Vale of Sidmouth, where the Duke of Kent (the Queen's father) died, and where the world-famous Knowle Cottage (now closed) was, by the late Mr. Fish, of Walworth, thrown open every Monday to the eager inspection of the curious. It was a museum, menagerie, conservatory, and geological collection combined; and it was a sad blow to Sidmouth when, on Mr. Fish's death at his Walworth residence, in 1861, no more "Fishites"—as the visitors were called—passed through the place.

On the east of Beer, across the White Cliff, is the little village of Seaton. Beyond lie the magnificent, yet terrible, landslips of Pinney; and, farther, the quiet and picturesque Lyme Regis, on the Dorset coast. More north is to be found the ancient, melancholy, and dreary town of Axminster, once famous for its carpets; with Honiton near at hand, which alike is celebrated for its lace and butter; and recalling to mind as well as taste certain treats in wholesome Devonshire cream, butter, and cider, I often think of the pleasant time spent at our out-of-the-way village on the South Devon coast. N.

THE SEWAGE DIFFICULTY.

A LECTURE on this subject was delivered some months since, by Mr. Baldwin Latham, C.E., at Maidenhead, before the Local Board of Health, in reply to a paper by Mr. J. D. M. Pearce, M.A., which was also read before the same Board; and both have been published in the form of pamphlets. Of Mr. Latham's able discourse* we give our readers an abstract:—

From remote periods works of drainage have been considered necessary wherever men have congregated together. Hence we find that the most ancient cities of the world were sewered. Then came a period in history when their benefits seem to have been forgotten or were ignored—when sanitary science, like many other sciences, descended to the very lowest ebb; and, though an object, as I will show you, of immense importance, and attended with great advantages, it has only been revived in its true spirit within the memory of living man.

The sewers of ancient cities were intended to convey the fæcal and other matter; but the early sewers of this country were intended only to carry the rainfall to the nearest stream. In fact, it was illegal, until 1815, to carry fæcal matter into sewers. Such matter was retained in cesspools, or by means of other contrivances. But the growing evils of harbouring such matter in the vicinity of or under our dwellings were so great, that the laws guarding sewers were allowed to lapse; but it was not until 1847 that it became compulsory to drain into sewers. Now, if we inquire how this great change was brought about, we shall find that it was not forced upon the country. No: the country adopted the measure in self-preservation; for it was not until epidemic diseases had devastated our populations, and were still threatening us with dire calamities, that works of sewerage were carried out. We find that in 1848 and 1849 no less than 53,293 men, women, and children of this country perished by that direful scourge, the cholera. Sanitary works were carried out in order to stem the tide of disease and death, and how they have accomplished that end, experience in towns in which they have been carried out will most fully demonstrate. At page 4 Mr. Pearce refers to "the failure of costly plans, which have been introduced" for the sewerage of London; but what is the failure spoken of? London, we find, is the healthiest metropolis in the world — far healthier than towns of much smaller size; and it is well known that, as the population increases in a town, the more difficult it is to retain the standard of health; yet London stands at the head of the large towns in our own country, because works of sanitary reform are carried out there more completely than in the other places. If we take Liverpool, Manchester, Birmingham, Leeds, or Sheffield, all of which retain excrementitious matter on the premises of the inhabitants, they are the unhealthiest towns you can bring forward. No population can be said to be healthy or free from devastating epidemics if living in the midst of aërial impurities arising from the detention of fæcal or other deleterious matters. Then it becomes a question of vital importance for every town to adopt such measures as shall free it from the abominations which more or less crowd every ill-drained or undrained place. A system such as Mr. Pearce deprecates, wherever carried out, has saved the lives of hundreds, and increased the standard of health among thousands. So it has fulfilled the conditions, and I may say the only conditions, that were laid down when the system was first inaugurated. Although the results of sewerage works are inestimable, I cannot but see that to some extent they have been marred by the state of pollution into which the rivers of this country have been brought. Yet it should be clearly understood that, although the present state of the rivers is a crying evil, it is not so great as the evils from which the towns have been freed. In fact, the lives and health of our citizens have been purchased at the expense of the rivers. It must be admitted that the purity of water is of great importance, and we shall not, as a country, derive the full benefit to be obtained from sanitary measures until our rivers have been freed from the abominations that have been poured into them.

In the opinion of Mr. Pearce, a rational mode is one that requires sewers, but also special appliances, such as pails, tubs, barrels, carts, horses, and men, for removing fæcal matter; in fact, he considers sewers necessary; and so must all the advocates, whether it be of earth closets or of any other description of sanitary appliance. They cannot get away from the simple fact that sewers are necessary in every town which chooses to deal in a proper manner with its refuse matters, and preserve the health of the community, the only difference being as to what should be sent into the sewers.

The great difference between applying liquid and solid manures is, that, while the former are applied to the plant, the latter are applied more properly to the land. In both cases, the land is the medium by which the nutriment is given to the plant: but, if two given amounts of fertilizing matter be applied, one in a liquid and the other in a solid state, the solid manure needs to be exposed to atmospheric influences until it has become soluble; after this it requires to be taken into solution by water, before the plant can utilize it; while, on the other hand, we find that the fertilizing elements in the liquid manure are presented in a form fit for immediate assimilation by the plant. From which fact it is obvious, that a greater number of crops can be taken with liquid than with solid manure; which is equivalent to an increased area of land; but with this great advantage, that you have only one rent or first charge to pay for it. Water is the vehicle that conveys nutrition as well to plants as to animals. The quantity of water that usually enters the roots of plants is extremely large; it is then evaporated through the leaves, leaving the fertilizing matter to build up the tissues of the plant. The vegetable kingdom always takes its food in a state of extreme dilution; in fact, a concentrated essence of fertilizing matter will effectually destroy a plant.

Mr. Latham then enters at large into the case of Croydon, where, as he observes, 2,500 persons are now alive who would have been dead had it not been for the sanitary works there carried out.

At page 32 he says, "Mr. Pearce states that 'Edinburgh has had the best possible opportunity of judging, during the 200 years it has been practised in Craigentinny meadows, of the merits of sewage irrigation, and that it is emphatically and finally condemned;' and he goes on to say, at page 10, 'and if Edinburgh gives it up, who hereafter will dare to uphold it?' The author has here quoted an article in the *Builder*, entitled 'The new Town of Edinburgh, its Drainage and Water Supply.' Yet I must say that the purposes of that article are greatly perverted. In reading the author's pamphlet, you would be led to conclude that Edinburgh was about to give up sewage irrigation; but such is not the case. Edinburgh has three outfalls for its sewage: one empties itself into the Waters of Leith, which have become far more foul than the Thames water before the construction of the intercepting sewers of London; another into Craigentinny Burn; and the third into a burn called Pow Burn. The system of sewers now being carried out (upon the completion of which the inhabitants may be congratulated) will free them from a crying evil, or that evil which exists in every undrained city. Edinburgh is an undrained city, and now adopts the system of drainage. But does it give up the system of utilization? No! The sewage flowing into the Craigentinny meadows will be utilized as in former years.

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* "A Lecture on the Sewage Difficulty." By Baldwin Latham, C.E. London: Spon, Charing-cross.

As to Mr. Pearce's own particular scheme, that gentleman says at p. 17:—

'I propose that the Board should make it compulsory to close every cesspit in the borough, and to substitute a pail to be placed under the seat for the reception of the whole of the excreta; that it should engage or enter into contract with a proper person to empty these pails daily at such times and in such way as they may think fit, and convey the same from the town in hermetically sealed barrels or cisterns. The sale would cover the expense, and leave a profit.'

There you have a scheme advocating the daily removal of human excreta from every house, leaving all other matters to find their way to the sewers. He admits that sewers are required, and house-drains will also be required; for what is the use of sewers in streets if you have not the drains communicating with them? And yet he would tell you that this is a system which is to save the expense of 8*l.* or 10*l.* for every house. It is no such thing. The cost of a water-closet is a mere trifle. And then you are to have a most expensive mode of collecting the material, and you are to have horses and carts for taking it into the country. To say nothing of the inconvenience of having the privacy of your houses invaded daily by men for the purpose of removing such abominable matter, is it not far better, taking a common-sense view of it, to let the sewage carry itself rather than you should carry it? And then you are told that, if you adopt this system, it will pay and leave a profit. A very similar system to that of the author's was adopted in the town of Hyde, in Cheshire. A certain company, called the Eureka Manure Company, undertook to collect the whole of the solid and liquid excrements of the population. Now, what has been the result in that town? Why, we find from parliamentary returns that the cost of applying this system to the town of 20,000 inhabitants would be 10,000*l.*; and the system is this, that water-closets or cesspools are done away with, that boxes or drawers are put under the seats of the closets, that these are removed from time to time, not daily. When this company was originally started, it was with the idea that they were going to give the people something for this very valuable matter; but they found out, after working a very short time, that they could not afford to give anything for it, so they took it for nothing. A little further experience demonstrated to them that, even that would not pay, so that they must make a charge of 2*s.* for every house; but before they have time to prosecute their labours any further an action is brought against them for creating a nuisance; they are found guilty, and the works are stopped, after incurring an expense and a charge of 2*s.*, which, if capitalised, would amount to 15*s.* per head of the population. The town still had to carry out a system of drainage just the same, and at as great a cost as if it had been done for the reception of the water-closets. After the failure of the company, the Corporation of Hyde undertook to collect the matter in the identical manner portrayed in the author's paper; but when they went to work they found it did not pay to collect, and then they gave three months' notice to the inhabitants that they could not collect it. If fertilising matter is of any value, certainly it is in those districts of Cheshire in the neighbourhood of Hyde, and yet you find that the corporation, from accidental circumstances, actually adopted the system of the author; and yet we find that it could not have paid them, and so they gave it up, and a great number of the houses have put up water-closets, and others unfortunately have had to revert to cesspools. From a list of over forty towns in this country, in which the local authorities undertake to collect fæcal matter from the houses, in not a single instance do they make a profit.

Birmingham is reported by the author as being one of the places that has an injunction against it for polluting its streams, yet it is not a water-closet town: not more than 5 per cent. of the whole houses have water-closets.

Birmingham is a town of ashpits and cesspools, and yet there you find the rivers polluted, and an injunction brought against the corporation, which would be the case in every town where a system is carried out that would only deal with fæcal matter; because it may be laid down as a rule that any water brought into a town and serving the domestic purposes of man is not fit to be afterwards turned into a stream from which his fellow-man may derive his supply of water, until it has been purified.

The system of the author, like that of earth-closets, attempts to deal with fæcal matter only, leaving all other matter to run into and pollute your streams, so that you will not be relieved from the injunctions, which is one of the principles set up by the author; and not only so, but the system, instead of bringing in munificent profit, would be worked at a great loss to the town.

In conclusion, I would say, with regard to those systems of filtration which seem to be strongly advocated by Mr. Pearce as being far preferable, in his opinion, to irrigation, that a person only knowing the very first rudiments of chemistry would know how impossible it is to purify sewage by filtration. Why, filtration is merely a mechanical separation. Filtration has been tried and found not to succeed. Other measures have been adopted, such as precipitation and deodorization or treatment by various chemical substances; there is no single case in which the plan has been found to answer. There is one point which will ever stamp precipitation, deodorization, or filtration as unsuccessful, which is this, that as ammonia is the chief constituent of value in sewage, and as there is no known mode by which it can be rendered insoluble in water, and as it is necessary, for the time being, to render it insoluble in order that it may be precipitated; on the other hand, if it it is assumed that ammonia may some day be rendered insoluble, then in an agricultural point of view the system would be a failure, because insoluble ammonia would be valueless.

I trust a case has been made out for sewage irrigation to your satisfaction. I came here to explain facts and elucidate truths, and I hope I have thrown some light on this very important subject, sufficient to enable you to see your way out of the sewage difficulty."

ARCHITECTURAL EDUCATION.

In the course of the opening address at the *conversazione* of the Architectural Association, elsewhere referred to, Mr. Spiers said,—I have from time to time during the course of my paper, made comments on the want of a theoretical education in architecture in this country; this absence of any system of teaching of the principles of either science or art has, of late, been deplored continually in the various journals, comparisons being drawn between the products of all countries in the Great Exhibition of Paris, and considerably to the detriment of our own. It would appear that, notwithstanding the immense advance which we had at one time acquired over other countries in engineering and commerce, the workmen of such countries as Germany and France, being instructed in the theory of their mechanical operations, were able to work with so much greater intelligence, that not only had they caught us up, but were really surpassing us on what we imagined to be entirely our own ground; and our great manufacturers, apparently not content with the result of the schools of the Department of Science and Art, have lately instituted commissions, to make serious inquiry into the system of the education of artisans abroad, with a view of introducing them into England. In art we have always been allowed to be far behind-hand, and though the progress made in England between 1851 and 1862 was such as to give us reason to hope that in a few years' time we should have equalled our foreign neighbours, this present exhibition shows us that we are still as far behind as ever. It would be out of the scope of an address to enter generally into the vast systems of education; but I wish to call your attention this evening to the great desirability of establishing some more definite system of architectural education. So long as the history and principles of art and architecture are completely ignored in our schools and colleges, as one of the most intelligent means of learning the history of nations, so long artists and architects must "*con amore*" instruct themselves in the best way they can, without expecting to receive from the public that assistance or approbation of their endeavours which is always necessary to the production of true art. At the present day the only class which can be said to take any interest in architecture are archæologists; and though I must allow that they have worked much good among us, to be always dependent on them would be fatal, as we should always be obliged to move in the groove of precedent. Of this groove, however, we must free ourselves in some way, and it is best to be done by forming schools, where students can walk together, interchange ideas, and co-operate with one another. In support of what I am now saying I cannot help referring to an admirable paper contributed to the American Institute by Professor Ware, who is now travelling in Europe forming materials for the formation of a school in America. Professor Ware remarks that "whilst every other branch of applied science has multiplied schools in every part of the country, the art of building, upon which more money is spent and misspent than upon any other, is handed down from generation to generation by personal tradition alone." "The system of articling or apprenticeship," Professor Ware says, "in America has disappeared, as being unsuited to the temper of the time, and no other sufficient means of education has taken its place. In the meantime the building profession is suffering from the isolation of its members; whilst in other professions they are brought together, as lawyers in court, physicians in hospitals. Architects never meet; and the profession presents the singular spectacle of a score of men, living and working within a stone's throw of each other, as much allied among themselves as they are separated from the rest of the community by taste and education, but each leading the life of a hermit, and not only cut off from the stimulus of personal intercourse, but, through all, are engaged in the solution of the same problem; never comparing results, nor profiting by each other's experience." Now our Association does much good towards remedying this state of affairs, and there is not one here this evening who will not bear me out, and especially the members of the Class of Design, when I speak of the great advantages offered in it for the study of architecture and the promotion of friendly intercourse amongst one another; but our members, or rather the members of those who attend here, are but limited, and a great deal has yet to be done. The Association has from the first exerted itself in favour of an increased architectural education, and from time to time has memorialised the Institute to that effect. To its pressure may be ascribed the formation by this body of a voluntary examination, and it did its utmost to promote the proposed school of which Mr. Scott threw out the first suggestions. The voluntary examination, for the possible reasons above stated, has almost fallen to the ground, and Mr. Scott's scheme never took wing at all. I hope, therefore, to be able to convince you this evening of the necessity of taking further steps in this matter. You will all, I think, agree with me, that the position of the Institute is such that, if a school were formed, it ought to be its chief promoter and director; and yet I fear that it may be taken out of their hands, for it is the intention of the directors of South Kensington to establish there a school of architecture, and the principles of the formation of this school will be adopted from one existing already in Paris, of which I propose in a few words to give you the purport and history. The "École des Beaux Arts" in Paris is, as you are probably aware, a Government Institute, open to students of all countries on their passing an examination. The chief prizes are, or rather were, awarded by a jury consisting of the members of the Institute of France; the secondary prizes by various professors of the school. Now, as many of these professors and some of the members of the Institute had private studios of their own, their feeling naturally prompted them to be indulgent to their own pupils when awarding the prizes. A considerable abuse, therefore, had crept into the school, causing at the time great disturbance. In the midst of this M. Viollet-le-Duc, the eminent Gothic architect, obtained the ear of the Government; and in consequence a decree was published in November, 1863, changing the constitution of the school as follows:—

First, the prizes were to be awarded by a jury selected from the architects in Paris.

Secondly, studios ("*ateliers*") were to be established in the school, under the care of Government inspectors.

Thirdly, any Frenchman might compete for the grand prize without being a student of the school. And,

Fourthly, a new staff of professors were appointed, amongst whom M. Viollet-le-Duc himself was named a professor of theory of art and architecture, and the student was to attend regularly all his lectures, pass examinations in them, and frame their designs in accordance therewith.

Now, much as the students (hitherto of classic tendency) appreciated the publications of M.

Viollet-le-Duc on Gothic architecture, the pill he wanted them to swallow was much too large to be taken at one time; consequently, after three ineffectual attempts to make himself heard in the lecture-room, he retired in disgust, and the Government allowed the school to relapse into nearly its former state, without, however, stultifying itself, by withdrawing the decree. Shortly after this circumstance, M. Emile Trelat, professor of the school of arts and manufactures, conceived the idea of forming a school of architecture, based on the theories of construction and construction alone. He pretended that art had nothing to do with architecture, and that all the problems of antiquity had been worked out by reasoning alone; the necessary conditions for stability and equilibrium being all that the Classic or Gothic architect had had to deal with. To M. Trelat, M. Viollet-le-Duc goes at once, to aid him in forming a rival school to the École des Beaux Arts; but, unfortunately, their principles were not the same. M. Viollet-le-Duc has the greatest belief in art and archæology, Mr. Trelat discountenances both. A compromise, however, seems to have been effected. M. Trelat would advocate the principles of art and lecture on them, if M. Viollet-de-Duc would give up archæology and the study of ancient monuments. The school, called "L'École Centrale d'Architecture," was formed two years ago; and when in Paris in August last I was conducted through the establishment, and there saw the result of the two years' labour. As far as architecture was concerned, the compositions were as wild, extravagant, and ugly as possible, and, as a rule, badly drawn; the system of study in the practical details of architecture, such as construction, materials, physics, &c., seemed good.

I was there informed that the authorities of South Kensington, fully alive to the great want of a properly defined system of architectural education, had made earnest inquiries into the whole system, bought a large number of drawings, which were pointed out to me, with the intention of forming a similar school at South Kensington.

Now, glad as I should be to see any system of architectural instruction established in England, it would be, I think, a source of regret to all here if the Institute should allow what is really their province, as the only chartered society of architects, to be taken out of their hands by a department which, though admirable in its own sphere, was founded for an entirely different purpose, viz., the artistic education of artisans.

Many will remember a paper read before the Association in these rooms, four years ago, by Mr. George Gilbert Scott, in which, after remarking on the utter inadequacy of the present system of articling, to supply to the student a theoretical knowledge of architecture and power of drawing, suggested a scheme of education, and recommended the nomination of a committee, consisting of delegates from various architectural societies, to make inquiries into the said scheme, and report upon it. The Association nominated four delegates, but as we have never had any communication from them, I may assume, as I believe to be the case, that this committee never met, and the whole affair was allowed to fall into "abeyance." Now, that scheme of Mr. Scott's, admirable in every way, and containing in it the chief elements of a school which will be one day established in England, had the further advantage of being more feasible than any other scheme (and these have been many), hitherto brought forward; but it would seem that a link of the chain, which connects its formation with the present system, is wanting. We are rather apt to sigh for fresh changes and improvements, without looking around us to examine, and find out what really exists: if, instead of endeavouring to graft a new and untried scheme on an old one, we were to take note of the numerous advantages and inducements held out already, and work them into a regular defined system and *procédé* of study to begin upon, the difficulty experienced would be less, and the result, I feel sure, more satisfactory.

With your permission I will just enumerate a few of the opportunities which now exist for the acquirement of a proper knowledge of the theory and practice of architecture, and show what little use is now made of them.

The Royal Institute of British Architects offer each year nine prizes and medals, of the intrinsic value of 170*l.*, and there were last year twelve competitors only in all subjects. They hold also a voluntary examination, to pass which four only presented themselves this year. They have a most valuable technical library; but, with the exception of the librarian and one or two others connected with its establishment, there are no readers.

The Architectural Association offer seven prizes, of the value of 24 guineas: there were twelve competitors in all this year. The meeting and classes, I am glad to say, are well attended, and good use made of the library, though it is small.

The Royal Academy offer four and three prizes, in alternate years, of the value of 180*l.* and 110*l.* respectively. The competitors for these prizes average four to six for all subjects. They have also, amongst others, a valuable course of lectures in perspective, and students are admitted to draw from the antique.

In addition to these societies we have the Architectural Museum; the Classes at South Kensington, and its library; the Society of Arts; and the lectures by Professor Hayter Lewis on architecture and construction at University College; and on constructive materials and design by Professor Kerr at King's College. A course of lectures also of the greatest utility at the two above-named colleges in surveying and levelling, geometrical and landscape drawing, descriptive geometry, mathematics, physics, geology, chemistry, &c., which to my certain knowledge are not attended at all by architectural students.

Here, then, is a long list of prizes and medals offered, and of inducements held out to students, which, from a want of some system of reduction to practical use, are almost entirely neglected; for the average number of competitors for prizes I find to be little more than one for each subject, whilst many of the lectures are not attended at all. How is this to be accounted for? I can scarcely believe when I see so many around me to-night, when I remember the large audiences at our meetings last session, that the younger members of the profession are apathetic, and care not for distinction; there must be some other reason, which I venture to think is this: during the period of his articles the student either does not yet take sufficient interest in his profession, or else is so hard-worked during the daytime as to be little inclined to continue his studies in the evening. When out of his articles he is inclined to fancy himself already an architect; and, instead of competing for those honorary prizes and medals as a *further means of study*, plunges into the vortex of public competitions, in which he is tied down to economy and practical conditions, and from which he learns little but of the partiality evinced by members of town councils, committees, and juries for their own private friends. Now, whether I am altogether right or wrong in my surmises, much of this could be remedied if the Institute would publish a pamphlet as advice to students and their parents or guardians of the course to be pursued in architectural education; pointing out, for instance, where instruction on special subjects could be obtained; what medals or prizes the student should compete for; and in what order and what should be the general skeleton of study to be adopted. Assuming, for instance, that five years be the least time (and it was formerly seven) that an architect's education can be completed, the first year might be spent in making up for that deficiency of scientific teaching, so much to be deplored, in our schools and colleges, by following the courses of lectures at King's and University Colleges, drawing from the cast at the Architectural Museum, and (when established) attending an elementary course of architectural design. The next three years should be spent in an office, learning practical work four days out of the six; the other two days being devoted to the getting out of competition drawings for the various medals and prizes before enumerated. The fifth year might be spent in travelling, and in preparation for the voluntary examination of the Institute, which might be supposed to terminate theoretically the architectural student's education in the same way as the degree of M.R.C.S. for a physician, and being called to the bar for a barrister on completing their courses of study. Now such a programme as this, which I throw out as a suggestion only, is one which is perfectly feasible at the present day, and would go far to remedy some of the defects which are felt by one and all in the present system, or, rather, want of system, of a course of architectural study.

In concluding my address, let me call the especial attention of the members to the syllabus set forth for them this session; and, in doing so, to remind them that the main object of our Society being mutual instruction, they are bound, to a certain extent, to attend our meetings as frequently as possible, and, by taking part in the discussion, to give whatever information may be in their power; and in order to be better prepared to do so, it is incumbent on them,—and let me *specially impress this on you*,—to read up and study beforehand the various subjects on which papers are read, that they may be able to impart to others the result of their labours, in return for that afforded to them,—so that working together and mutually assisting each other in the great object we all have at heart (viz., the advance of architectural art), remembering that the monuments we are called upon to erect,—if not more lasting than the recorded memory in history, painting, or sculpture,—of our great heroes and statesmen, exert a far more extended influence from their magnitude, utility, and constant presence amongst us. That as in all ages the architecture of a country has testified more than aught else to its greatness, so we have before us the proud calling of raising those edifices which shall in generations to come bear witness to England's greatness and power, and may thus attain to such honour as that which attaches itself to the memory of that great architect, Sir Christopher Wren, in whose *chef-d'œuvre*, St. Paul's Cathedral, the passing traveller now reads these words,—

"*Lector, si monumentum requiris, circumspice.*"

THE MIXTURE OF STYLES IN A BUILDING.

ST. ALBAN'S ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE usual autumn meeting of this really useful society was held last week (Thursday), in the Council Chamber of St. Alban's Town Hall, and was well attended, especially by the fairer sex. There was, indeed, much to attract, for on the walls of the room—and it is a handsome one—were hung some 200 folio-sized water-colour drawings of churches in Normandy, done with scrupulous care and spirit by more than a master-amateur, the Rev. J. Lewis Petit.

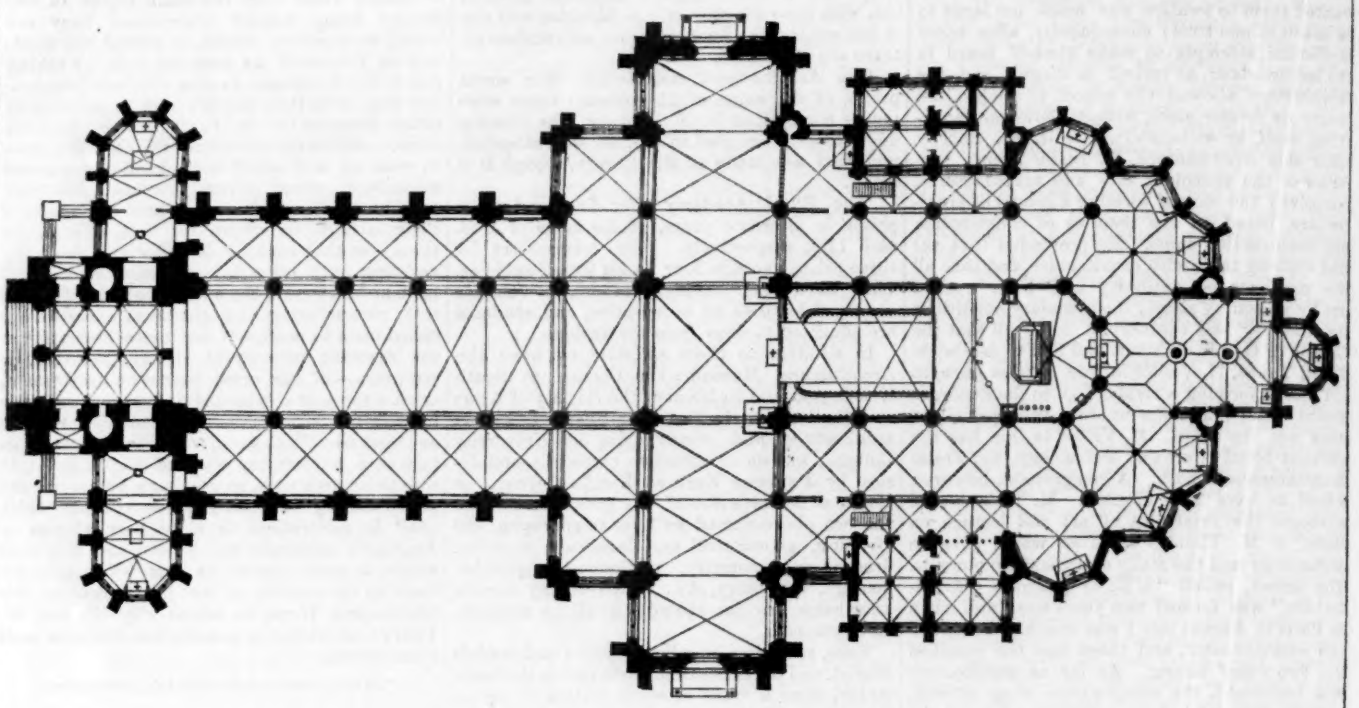
The meeting opened with a brief but sensible paper by Mr. Grove Lowe (the king of coin collectors in St. Alban's), called "Cold Harbours"—a puzzling subject among English topographical antiquaries. There are several "sanctuaries" (or Alsatian retreats) of the name in Hertfordshire—now, of course, of no use whatever to the murderer or the thief.

There was a "*capital messuage*," as Stow calls it, of this name in Dowgate Ward, on the Thames, in the City of London. The etymology of the name continues to be a riddle. Stow spells it "Cold Harbrough." A church in London, called Allhallows the Less, or Allhallows on the Cellars, was to be seen in Upper Thames-street before the Great Fire of London in 1666. Mr. Cunningham has a separate article upon it in his "Hand-book," with quotations from Ben Jonson's "Silent Woman," and Heywood & Rowley's "Fortune by Land and Sea," to which Mr. Lowe might have referred with advantage.

Mr. Lowe's paper was followed by Mr. Petit, who, from a few notes, and a good memory, proceeded to give a very interesting account of the "*discrepancies of style*" in the same building, which he was inclined to look upon rather as beauties than deformities; nor was he willing to look differently on the picturesque pent-house bits that surround so many fine old cathedrals and churches on the Continent, and, as at York, give grandeur to the whole elevation. These, when they are unmistakably old, he would not pull down. He then referred to the beauty of the High-street, Oxford, which, by the way, must have been once far more beautiful in its irregular sky-line of roofs than it now is.

Here is a sample of Mr. Petit's matter:—

"Among the objects which occupy a prominent position in the Acropolis of Athens, is a Mediæval tower, perfectly plain, and evidently intended for the purposes of defence; it was, I believe, erected by the Venetians. It is possible that a rigid antiquarian, exclusively devoted to the art and architecture of ancient Greece, might wish this tower to be pulled down, as out of character with the pure Classic remains of the Propylœa, to which it is annexed, of the sublime



PLAN OF CATHEDRAL AT LINZ, ON THE DANUBE.—Mr. Stadtz, Architect.

See p. 794, *ante*.

temple of the Parthenon, and the other relics of an age unsurpassed in the beauty of its productions. I confess this is not my feeling. I do not look upon the tower in question as any blemish in the scene. It rather improves than injures the general outline; it by no means detracts from the dignity of the other buildings comprehended in the same view, and it may have its value as a historical monument; for if the age of Pericles be the most interesting period in the history of Athens, it is not the only interesting period, and we are not called upon to sacrifice the records of other periods, for the sake of fixing the attention more especially upon one. If I am right in assuming that the individual tower is not out of keeping with the rest of the picture, it becomes a question whether there is any general principle which constitutes harmony between buildings altogether different in their character and architectural style. I feel very certain that my views on this subject will not meet with general acceptance, and I am not in the least disposed to bring them forward in a dogmatical manner; still, I trust they may furnish some suggestions not without value even to the practical architect." "We all know how perfectly the different Mediæval styles harmonize together in our cathedrals and large conventual churches. Your own magnificent abbey offers the finest illustration that can possibly be found. What can be more different or opposite in character than the rude Norman tower and transepts, and the light and elegant Decorated choir? The nave comprises the Norman, Early English, Decorated, and Perpendicular styles (you must excuse me for sticking to the old terms, as I am used to them), and each worked in its most distinctive and characteristic manner, and yet who that has an eye for the picturesque, or a feeling of the value of architectural history, would wish to replace the effect by one of uniformity? Ely, Gloucester, Norwich, Winchester, Tewkesbury, are magazines of several Mediæval styles, which are mixed and combined in the most perfect harmony; and the list, as you well know, might be much enlarged."

"Now my object is to suggest an inquiry as to what is the principal or the pervading element which gives to these groups that harmony which they decidedly possess. We notice that in all the cases to which I have referred the builder of every part has had his own definite aim and purpose, and has worked in the style, whatever it might be, which belonged to his own age and country. It may appear a paradox, but I fully believe that there exists so much harmony in each group, because there was so little attempt on the part of the designers to ensure it. Their honest independence has proved a firmer bond of union than the most subtle adaptations and imitations. To my mind there is nothing which is less in keeping with an old Gothic building than a new Gothic building, not because it is inferior to it either in design or workmanship, but because the one actually belongs to its own age and expresses its spirit, and the other does not. It may be, or it may not, that the Gothic will again become our national style; if it does, there will be something about it to characterise it as such; and then it will no doubt harmonise with old Gothic on the same principle on which any building designed in the style of its own period will harmonise with it; nor do I suppose the similarity of detail will do otherwise than increase the harmony, but at present I doubt if even the most careful reconstructions, except it be on a very small scale, will perfectly satisfy the eye and the mind. In adaptations it is difficult to avoid deception on the one hand, or unsuccessful imitation on the other. Architecture is too high and noble an art to indulge in deception; and an imitation, to be worth anything, must be but little short of a deception. Our Gothic architects, are, indeed, now striking out a style in some respects distinct from and independent of the genuine Mediæval styles; but while we cannot but regard their efforts with respect and admiration, and do honour to their genius, neither can we allow that they have as yet accomplished the task of forming or establishing a national style, and one expressing the spirit of the present age. But it is not my wish now to discuss the merits of rival styles; I would simply express my conviction that in almost every case in which buildings of different periods combine in a pleasing and satisfactory manner, each building is a genuine production of its own period, and not an imitation of the style of another. If we had a national style of the present day, I would rather see important additions, or what are called restorations, in our Mediæval churches, carried out in such a style, than in imitation of the older building. It was in this manner that the Mediæval architects themselves did their work."

Here is another example:—"The domestic style of architecture which prevailed in Queen Ann's time, at least such specimens as do not exhibit the classical orders too prominently, has always appeared to me to harmonise extremely well with Gothic buildings, and it is a style which might be used in the present day without giving the idea that we are adopting the manner of an age different from our own. For it is a style which, I may say, without any modification whatever, is calculated to meet all the requirements of the day, whether we want size or number of rooms, fine proportions, good ventilation and lighting, convenience of passages and staircases, or a stately and dignified aspect. All these may be obtained in the Qneen Ann style, with as little waste of material, or unnecessary expense, and with as much attention to durability, as any style that can be named." My belief is that genuine works of excellence, if they are brought together, as it were naturally, by accident, and without apparent effort, would always harmonise. I believe that Karnak, the Parthenon, the Colosseum, and York Minster, so brought together, would be found in harmony. I do not say that an artist could so bring them together, that is quite another question, for the great charm in such combinations is that they are not intended, or designed, for effect: the principle of unity is something natural, not artificial. If it is impossible to define or discover it, depend upon it we shall not find it impossible to create it. If there is anything in what I have said, the practical lesson we should draw from it is in the first place that we work, as far as it is possible, in our own national style, and that of our own age; or if there is not such a style, then take for our models such examples as seem best fitted to meet the purposes and the requirements of the present day, and which have architectural excellences we can appreciate. If such be found among the Mediæval styles which have passed away, well and good; let us adopt it by all means. But if not, we are no more tied down to Gothic, than the Greeks were to the Egyptian, or the Romans to the Greek, or the Romanesque, Byzantine, or Gothic architects were to either. The men of the Renaissance did not think it necessary to conform strictly to their ancient models. Such an architecture as that of the Middle Ages could not pass away without leaving some permanent mark, and Italian churches show much that is Mediæval in construction, composition, and spirit. The style, though derived from an ancient source, is anything but a tame and pedantic reproduction."

Some votes of thanks terminated the meeting.

COMPETITION.

Cheshunt College, Hertfordshire.—The design of Messrs. Lander & Bedells, of London, has been chosen, in a limited competition, for the intended new buildings at this college.

THE CHURCH OF ST. MAURITIUS, COLOGNE.——Mr. Stadtz, Architect.

See p. 794 ante.

SIR ROBERT KANE ON TRADE UNIONS.

At the Social Science Congress, Belfast, Sir Robert Kane delivered an address, as president of the Economy and Trade Department. Touching on the question of trade-unions, he said,—To arrange the respective claims of capital and labour in the division of profits at any stage of an industrial undertaking, should require in itself very accurate knowledge of details to avoid injustice, and it is not surprising that, where both parties are interested in the result, and neither quite free from prejudice, serious difficulties and collisions should occur. It is, however, consoling to observe, that notwithstanding the deplorable revelations recently made at Sheffield and elsewhere, there has been of late years a steady tendency to more temperate and rational consideration of those questions both by masters and men. Instances of violence have been rarer and less serious, and the economic principles by which such questions must be governed have obtained more general acceptance. The gradual diffusion of education among all classes, the discussion of those subjects by the public press and in the Legislature, has helped to dispel a great deal of ignorance which had hitherto prevailed, and which was by no means confined to the lower or working classes, whose action, in seeking to protect themselves by associations for mutual defence against the overwhelming influence of capital was, when kept within proper limitations, not merely compatible with, but a consistent corollary from economic principles. The voluntary association of the members of any trade or industrial occupation to collect facts as to the circumstances of that trade, to discuss such questions as may influence its welfare, to determine and mark the qualifications of a skilled workman, and to propose the rate of wages by which his labour should be paid, cannot be considered as overstepping the legitimate field of action, provided that no attempt is made to coerce or injure those who do not freely embrace its membership and adopt its rules. An individual and isolated workman is so powerless—he is practically so unable to stand out for a higher price—his necessities are so pressing, and generally he is so ignorant of what really influences the labour-market at the time, that, unless by union with his fellows, he is not in a position to get even his plainest rights, if it is the interest of his employer to refuse them. On the other hand, by the discussion to which the relative claims of capital and labour, of the respective rights of the employer and employed, must be subjected at those meetings of the most active and best informed among the working-classes, many of the prejudices which darken the mind of the working-man in regard to his employer are certain to be weakened, if not removed, when he obtains more information as to the circumstances of his branch of trade. Hence, although their agency has been so often employed for purposes which nothing can justify or even palliate; although frequently made mere instruments of the vanity of ambitious men who prey upon the simplicity and absorb the funds of the honest artisan, the operation of trade societies has been, upon the whole, more frequently useful than otherwise, and may, as I believe, be rendered highly beneficial in arranging all questions in dispute among the industrious classes. The fearful system of outrage that has been revealed by the inquiries lately conducted at Sheffield will, in itself, prove the necessity for some legislation, which, whilst firmly repressing by condign punishment all attempts at violence or coercion, will recognise and support that which is wholesome and just in trade organization, and provide a legitimate and authoritative tribunal for the adjustment of such questions as may be in dispute between masters and men. A very useful and effective agency in abating prejudices and diffusing sounder knowledge of the economic laws which govern labour and its price, has been the establishment of co-operative societies, where the property of a factory or other undertaking is held wholly or in part by the workmen themselves, and where consequently they have to bear the responsibilities when they enjoy the profits of capital, as well as of labour. There is now no doubt of the practical success of a large proportion of the undertakings founded on that principle. Not merely in manufactories and general stores, but in mining and even railway management, that principle of co-operation has been tried, and with success. In Great Britain, in America, in France, and Germany, the workmen have thereby learned that the rate of wages is by no means at the caprice of the employer; that the prices of produce may be raised and yet profits be none the larger, if the prices of raw materials have advanced in an equal or greater proportion. These co-operative undertakings have also had a valuable effect in bridging over the chasm which had for so long and so injuriously separated the capitalists and the working classes. For these countries, especially when, by the gradual development of our constitutional privileges, the middle and working classes are yearly acquiring more and more influence in public affairs, it is important that no feeling of hostility or estrangement should be allowed to remain between the employers of labour and those whom they employ; that all should feel that they are members of one common body, the producers of public wealth, the real sources of national power; that from the humblest workman to the great capitalist, there is but a graduated hierarchy, in which the ascent, though difficult, is not impossible to energy and talent; that the interests of all the industrial classes are indissolubly united, so that, for true and permanent success with men and masters, the surest course is mutual goodwill and co-operation. When it is fully understood that all civilised society is based upon the reciprocity of rights and duties; that the property of the humblest worker in the products of his toil is equally sacred and inviolable with the hereditary rights or the accumulated treasures of the greatest in rank or wealth; that, under the protecting ægis of public law, the weakest is safe from injury or injustice; then those barriers of ignorance and prejudice which have for so long obstructed the normal relations of landlord and tenant in Ireland will of themselves fall down, and the true interests of both classes will be found in friendly intercourse, fair business contracts, and co-operation for the general good.

THE LORD MAYOR AND THE ART-UNION OF LONDON.

The Lord Mayor (Sir Thomas Gabriel) entertained at the Mansion House, on Friday evening, the 25th ult., the council of the Art-Union of London, including Mr. Antrobus, F.S.A., Mr. Henry Baker, Mr. Chas. Barry, Mr. Bennoch, F.S.A., Sir William Bodkin, Mr. Broadwater, Mr. Butterworth, F.S.A., Dr. Dickson, Mr. Godwin, Mr. Thos. Grissell, F.S.A., Mr. Henry Hayward, Mr. Jas. Hopgood, Mr. Charles Hill, F.S.A., Mr. R. Hudson, F.R.S., Mr. Charles Mayhew, Sir Chas. Nicholson, bart., Mr. J. R. Planché (*Somerset Herald*), Mr. Lewis Pocock, F.S.A., Mr. Zouch Troughton, Mr. T. S. Watson, B.A., Professor Westmacott, Mr. Thos. Williams, Mr. Alderman Wilson, and others.

In the course of the evening,

The Lord Mayor said,—Nothing tended so thoroughly to elucidate any subject under consideration as just and correct comparison, and nothing so fully illustrated the marvellous acquirements made by society in the present day in the arts and sciences, and in everything that bears upon the moral and social condition of the people, as comparing the present state of things with the condition of society thirty years ago. And, amazed as we should be at the progress made in that time in all that conduced to commercial and political greatness, when comparing our present mode of communication and transport by telegraph and steam with the modes known and used thirty years ago, we should be no less astonished at the advancement made in the physical and moral condition of the people, and especially in the general dissemination of a taste for the Fine Arts, when looking back at the state of society in these respects thirty years. The sole adornment of the dwellings of the humbler classes then consisted in a few vulgar, staring earthenware figures, or the well-known pictures of a fine lady with a red face and dazzling green gown, inclosed in the universal black frame. These, fortunately, have become things of the past, and the artisan and humbler classes show that they fully appreciate the capital engravings, illustrating the first masters of the day, and other works of taste brought within their reach. Nothing had tended so much to bring about this marked improvement in the tastes of the people as the labours of the Art-Union of London, the council of which society had that day honoured him with their company. This society, composed of gentlemen of all professions and calling, united for the single object of the advancing of art, had, during the last thirty years, expended about a quarter of a million of money in bringing within the reach of all classes the choicest specimens of works of art; and by thus familiarising the public taste with things of beauty, had helped the growth of the appetite for them by the things it fed on. If ever the labours of this society were necessary, they were so at this time, for nothing could enable us as a nation to keep our place among the manufacturing countries of the world but a thorough education, and training of the people in all that belongs to the arts. A love for the beautiful was innate in the human nature, and the rudest savage would prefer a decorated and well-proportioned tool or instrument to a rough, ugly article; but, if this is true in that class of manufacture, how much more so was it with reference to all those articles of every class required to meet the luxurious taste of the day incident on the vastly increasing wealth of every country. We might therefore depend upon it that if we wished to avoid seeing ourselves altogether distanced in the manufacturing of all articles in which any thing like taste could be introduced, and left as the manufacturers of only coarser articles,—in fact, becoming the hewers of wood and drawers of water among manufacturers,—we must diligently do all that tends to improve and raise the taste of our people; and in conclusion he said he would then give as a toast the name of the society which had done so much in bringing about the good already accomplished, joining with that toast the name of Mr. Godwin.

In returning thanks to the Lord Mayor on the part of his colleagues, as well for the observations he had then made as for his hospitable reception, Mr. Godwin said many years had elapsed since, when their esteemed co-member, Colonel Wilson, was Lord Mayor, the council had been received in the City. The career of the Art-Union had been an eventful and a remarkable one; and, when the history of the progress of art in this country should be fairly written, it would be found that the Association had played no unimportant part. The early progression of it was remarkable. When Mr. Henry Hayward, Mr. Lewis Pocock, Mr. Bond Cabbell, and himself, the only four of the founders remaining in the council, had sat down at a small table in a small room first to organize it they had hardly expected such a result as had followed. Scarcely able to obtain a subscription of 500*l.* in the first year, it soon became 1,000*l.*, then 2,000*l.*, 5,000*l.*, 12,000*l.*, 14,000*l.*, and so mounted to nearly 18,000*l.*, after which it subsided to a comparatively steady income of from 12,000*l.* to 14,000*l.* a year, according to the aspect of social and political events. About 340,000*l.* had been raised by its means, the whole of which large sum, with the exception of the necessary expenses for rent, clerks, printing, and so forth, had been devoted to the encouragement of artists, and the dissemination of works of art. The gallant admiral, Sir Alexander Milne, in replying for the Navy, had spoken of the extent of the service, and had mentioned many foreign ports. At all those ports, wherever an English man-of-war floated, the Art-Union had a colleague engaged in the dissemination of works of art: wherever, indeed, English men and women were located, whether in China, India, Barbary, Egypt, Russia, Turkey, New Zealand, or the gold diggings of Australia. It was surely no small thing thus to have spread over the world an associated brotherhood interested in the progress of the arts that ennoble and refine. Looking round the hall in which they were assembled, he was reminded of a member of their council, the late City architect, through whose endeavours mainly the corporation had been led to aid nobly the sculptors of the country, by filling the niches of that apartment with their works. It was to be hoped that before long the corporation would be led to call in the aid of the sister-art, painting. Strange to say, there was not a single picture in that Mansion House of the richest city in the world. He hoped he might not be thought impertinent for mentioning it: at any rate, it was a fact not to be proud of, and ought to be remembered. Many then present would remember a building in Venice, known as the Scuola of St. Rock; which, built by a fraternity of merchants 300 years ago, and still belonging to them, had been visited and enjoyed by pilgrims from all parts of the world. And why? Because that corporation had wisely devoted some of their funds to its adornment by Tintoretto and Titian, who had there set up grand specimens of their art. For many years the reports of the Art-Union had urged the desirability of placing works of art on the walls of

public meeting-places, and where they could delight, appeal to, and influence the multitude. Public galleries of works of art in our provincial towns were greatly needed. In most French towns, as at Rouen, Caen, Lyons, Lille, Bordeaux, there were galleries of art to which the public had free access: it was surely not creditable to us,—it was not wise, even commercially,—that, with the exception of those in the three capitals, no such collections were to be found in England. He was glad, however, to be able to mention, as a fact not yet generally known, that the corporation of Liverpool were about to redeem us from this opprobrium, so far as their town was concerned, having determined to erect a gallery and found a public collection of works of art. A leading member of that corporation and their architect had already commenced the examination of the principal picture-galleries in Europe, with the view of determining on the best plan; and as soon as that was settled the work would be commenced. It was earnestly to be hoped the example would be followed in our other large towns.

EVENING AND SATURDAY AFTERNOON RESORTS.

The London Early-closing Association has issued a printed syllabus of places of resort for instruction and amusement, such as literary institutions and evening classes; national institutions, including museums and art collections, to which should have been added the Schools of Art; and, for recreation, gymnasia, swimming-baths, parks, and environs, &c. It would have been well to have added places of temperate refreshment with instrumental music for the evening, where good tea and coffee, chops, &c., could be had at very moderate prices, and without either the strong drinks or the buffoonery of music-halls; but there is really no such place of resort in London at present that we know of. Hungerford Hall was the only thing of its kind, and it was knocked down when the Charing-cross Hotel and Station were built. We understand, however, that it is about to be revived, with the same name and on precisely the same principles, in the arches below the Charing-cross Hotel itself. At the old Hungerford Hall, a small teapot of excellent tea, with loaf and butter, and sugar *ad libitum*, could be had for sixpence, and good instrumental music all the evening, from five o'clock p.m., with chess and draught boards, newspapers, &c., all for nothing. The great want of such temperance *cafés* in London has often been pointed out in the *Builder*, and it is to be hoped the hint will be followed up. As regards instruction there are able and excellent scientific lectures nearly all the year round and at almost nominal fees, on Monday evenings, at the Museum of Practical Geology in Piccadilly. These lectures have not been attended as they ought to be, nor are the Schools of Art.

SCOTLAND-YARD.

It was in Scotland-yard that Evelyn built and furnished a house for Mr. and Mrs. Sidney Godolphin, ancestors of the Dukes of Leeds. It will be remembered that Evelyn's great-great-grandson, the late Hon. E. Venables Vernon Harcourt, placed a MS. of the renowned diarist in the hands of the Bishop of Oxford for publication, in 1848. It was a biography of Mrs. Godolphin, who was one of the maids of honour of the queen of Charles II. The good Evelyn calls the subject of his memoir a "constellation of perfections," a "young saint," a "jewel," a "starr," an "incomparable Christian, virgin, wife, and friend;" and seen, as he saw her, against a background of frivolity, luxury, and licentiousness, her purity and piety could scarcely have been depicted with less encomium. Her affectionate friendship and early death invested her memory with a peculiar interest in his eyes; and he required but little solicitation to put the particulars together which constituted the neatly-written MS., that for 170 years remained unpublished. She died at twenty-five, in Scotland-yard, leaving an infant son ten days old. Her husband made no second marriage. He was created Earl of Godolphin, and lived to see his son, Francis, thirty-four years old. The son married the eldest daughter of the Duke of Marlborough: a daughter of this marriage, Mary, married the fourth Duke of Leeds.

When Mrs. Godolphin was five years old she was taken to France by the Duchess of Richmond, who gave her into the care of the Countess of Guildford, then in attendance on the widowed queen of Charles I. When her Majesty came back to England after the Restoration, the child was restored to her mother, Mrs. Blagge, wife of Colonel Thomas Blagge, groom of the bedchamber to Charles I., with whom she stayed in London till the Great Plague broke out. She was visiting her father's relations in Suffolk during the prevalence of this scourge, when the Duchess of York made choice of her as a maid of honour. Upon this, though only twelve years old, she removed to court, and lived there till the duchess died, when her services were retained by the queen, and she removed from St. James's to Whitehall. It was here she made the acquaintance of Evelyn. After seven years of attendance on the queen, during which time she scrupulously held herself aloof from the surrounding gaieties, she begged permission to retire, that she might devote the whole of her time to works of piety and charity. After some delay, and with much reluctance on the part of the king and queen, she obtained her suit. It is suggestive to learn there was another kind of life pursued in that gorgeous palace besides basset-playing, love-song-singing, and "toying," with three duchesses at a time. Before dawn, Evelyn tells us, there was always one figure there, kneeling in adoration of the King of kings. And, again, "Were it never soe wett, colde, and darke, even before daybreake, in midst of winter," she was always present at the first of the four daily public services in the chapel, and attended the rest whenever she could contrive to do so. It was on the occasion of her subsequent marriage, that Evelyn built the residence in question in Scotland-yard. We know him to have been a man of taste, the patron of Grinling Gibbons, and can well imagine that these premises were as "sweet and pretty," and full of "all manner of conveniencys," as Mrs. Godolphin appreciatingly and gratefully declared them to be. Where are they now?

THE STAGE.

Haymarket.—Mr. Sothern has returned with the untiring *Dundreary*, strengthened by the advent of Miss Robertson (sister of the dramatist of that name), from Drury Lane. Additions were needed to the lady portion of the company here, and this is a good one. "The Winning Card" is a poor farce, but it enables Mr. Compton to make the audience laugh.

Princess's.—"Arrah-na-Pogue" is running well again: and certainly, if a very interesting and well-constructed story, capital acting by Mr. Vining, Mr. and Mrs. Boucicault, and Mr. Dominick Murray, and very charming scenery, are of any avail, this is not to be wondered at. It is something, too, to have a piece which has been put into French, not translated from it.

Adelphi.—It is some time since a piece was so well put upon the stage here as "Maud's Peril" has been,—an effective though not in all parts agreeable drama by Mr. Watts Phillips, which will, doubtless, run some time, and ought to do so. The assistance of Mr. Grieve and his sons has been obtained in the scenic department, and with excellent effect. The first scene, an ornamental lodge with wide open verandah round, hung with plants in pots, and showing the hall and park beyond, is excellent; and the same may be said of an interior that follows. Miss Herbert has a part that suits her well, and does full justice to it, though her declamation is a little too stilted. Mr. George Belmore, one of our best actors, plays with great power and intelligence a returned convict. On the first night his acting was a little overdone, but the experience of a few nights has brought the necessary moderation.

The New Queen's.—"The Double Marriage," the romantic play with which Mr. Alfred Wigan has opened his new theatre has the great merit of being entertaining. Mr. Charles Reade being a competent and well-known author, some disappointment has been manifested on the discovery that the story mainly proceeds from a French source. It would seem almost that we have few, if any, dramatists who can invent a dramatic story. Our own belief is, however, that no one ever invented anything,—certainly not a whole play. Nothing can come of nothing. Everything is built up. Many rills are needed to make a river, and a great many story-tellers went to the making of Homer. Let this pass, however, just now. Acted and mounted as "The Double Marriage" is, it can scarcely fail, in conjunction, too, with the bright new theatre, to draw large audiences for some time to come. Mr. Wigan, Miss F. Addison, and Miss Ellen Terry are its main supports, all acting admirably; but Mr. W. H. Stephens, Mr. Lionel Brough (new to London as an actor), Mrs. Saville, and Miss Henrietta Hodson, contribute greatly to the general result.

THE CO-OPERATIVE MOVEMENT.

The co-operative principle, in various forms, is making rapid progress.

A numerous meeting of the inhabitants of Holloway and Highgate has been held in Hampden-hall, Hampden-road, in furtherance of the movement. The meeting was composed almost entirely of working men and their wives. Mr. W. T. M'C. Torrens, M.P., presided, and expressed his approval of the co-operative movement. Mr. Heine made an interesting and suggestive explanatory statement, and in illustration of the importance to the working classes of co-operation, and the practice of the ready-money principle in the purchase of their food. Resolutions were passed approving of Mr. Heine's plan, and virtually establishing a company, to be known in future as the Holloway and Highgate Co-operative Society (Limited).

A Co-operative Society for the sale of meat was formed in London in May last. The store is at 23, Rood-lane, Fenchurch-street. Associates pay 5s. a year; members 1*l.*, without further liability. The present price for the best meat is 8½d. per lb.; everything else at corresponding prices. The patrons are Earl Spencer and the Earl of Ducie. The committee consists of Mr. J. W. Malcolm, M.P., Captain Holman, Mr. D. Forest, Captain Mackenzie, of the London Scottish, and his brother, Mr. A. G. Mackenzie. Captain S. Flood Page is the chairman of the committee. The society is managed with a view to reduction of prices, and not to profit.

A lively scene took place in the carcass market of Bristol on Saturday morning last. No sooner were the gates thrown open than some fifty or sixty workmen, *representing as many firms*, made their appearance, and commenced buying meat in the carcass, to be cut up and retailed at "prime cost" to their fellow-workmen. Some of the butchers were outrageously abusive, and a good deal of ill-natured "chaff" went about, but the purchases were made, and the workmen attained their object, for during that very day meat went down in price in Bristol.

At Highbridge, Somersetshire, a "co-operative bakehouse" is about to be started to sell cheap bread; and a firm has undertaken to purchase sheep and oxen and have them killed, so as to sell the meat for much less than do the local butchers. In this way prime mutton is being sold at 6d. a pound, and good beef at 5d. and 6d.

The movement has made great progress in Cheshire, there being no less than twenty-seven societies at work in it, which is a high average for the population. The largest of these is at Stockport, which has 660 members, and the next at Hyde, which has 624 members. The Sunderland-street Equitable Provident Society in Macclesfield has 320 members, 148 of whom were admitted during the last year. The amount received on shares during the year was 968*l.*, and the whole share capital was 1,241*l.* The cash received for goods during the year was 12,980*l.*, of which 1,319*l.* was profit. Of this 1,041*l.* were distributed in dividend to the members; 117*l.* were applied to paying off interest; 153*l.* were set down for depreciation of stock; and 6*l.* expended in charitable gifts.

Mr. D. P. Fowell, of London, has delivered a lecture at the Odd Fellows' Hall, Falcon-street, Ipswich, upon "Co-operation—what it has done and what it will do for Working Men." At the end a large number of those present gave in their names as members of a store. A successful co-operative store is in work at Chelmsford.

At Edinburgh, steps are being taken for the organisation of a supply association, on the plan adopted with so much success in London by the members of the Civil Service. A meeting of gentlemen, comprising representatives from various banks and Government offices, and a number of professional men, has been held, according to the *Scotsman*, and a provisional committee nominated to take preliminary steps. The proposal has been received with much favour

by the large class of householders having stated incomes, such as those engaged in banks, insurance offices, Government offices, and other like employments, upon whom the increasing cost of living presses with great severity. Already some of the leading establishments have offered to deal with the association on the same terms as in London.

A SWEET SHOP IN OXFORD STREET.

No. 86, Oxford-street, a house erected a few years past, with some architectural pretensions, has lately undergone considerable internal alterations, to render the premises applicable for the purposes of a first-class "Confiserie Française," similar to those tasteful establishments of the Rue de la Paix and the Boulevard des Italiens. The front has been cleverly decorated, in the Pompeian style. The want of flat surfaces on which to execute the delicately designed ornaments of the style, rendered the treatment somewhat difficult. However, our attention is more with the interior, inasmuch as we have here specimens of French shop fittings and decorations. The whole has a pleasing effect. The colouring has been kept to the same tone as the furniture and fittings, and is relieved by the judicious introduction of contrasting colours, used in small quantities in their original intensity. Greater part of the furniture has been made in France, and very well made. The coloured decorations were executed by Mr. Homann, who is, we understand, carrying out some of the decorative work at the Mausoleum erected by her Majesty to the late Prince Consort. Messrs. Finch Hill & Paraire were the architects. The costliness and elegance of some of the *bon-bon* boxes here will surprise ordinary visitors.

PRESERVATION OF STONE.

In a recent number we printed the heads of a paper on this subject by Mr. Spiller, read at the Dundee Meeting of the British Association; and we had previously alluded to a remark which was made in the discussion on that paper by Mr. George F. Ansell, to the effect that the best plan for preserving stone would, in his opinion, be by exhausting the atmosphere from the wrought or "worked" stone or marble by means of an air-pump, as it is done in the case of "creosoted timber," and then to admit an atmosphere of that dense gas which is known as ter-fluoride of silicon; or, as Mr. Ansell preferred to call it, fluo-silicic acid. The president of the section remarked upon this suggestion, that it was just such a one as cropped up at these meetings, and was likely to be of practical value. Those who are interested in the preservation of stone will examine this proposition, and should take some steps to carry out the idea conveyed. Let us look at the subject a little more in detail. Mr. Ansell stated that he would operate upon the stone when it was fitted for its final position, whether as statue, block, or moulding, and he expressed an opinion that a stone so treated would become one solid mass of insoluble substance, upon which the atmosphere would have no influence, and that, in fact, marble so treated would become as permanent as granite, without loss of colour. This, if it be the fact, is easy of demonstration. The action of the gas would be as follows: when the stone had been exhausted, as the term is, it would represent a kind of sponge, into the pores or interstices of which the ter-fluoride of silicon would, when admitted, permeate, so that the stone would become saturated with that dense gas instead of with water and air, as it usually is. So soon as the stone thus prepared came into the air, the moisture of the atmosphere would act on the ter-fluoride of silicon, and mutual decomposition would ensue, one result of which would be to fill the interstices of the stone with pure silicic acid, better known as sand; while the ultimate result of the other substance would be the formation of fluoride of lime, commonly known as Derbyshire spar. In the case of ordinary mortar it is well known that the sand under the influence of time, moisture, &c., combines with the lime, and forms an insoluble silicate of lime: hence Mr. Ansell expressed an opinion that the silicic acid in the case proposed would also form a silicate of time; and it will be seen that these changes are assumed to take place throughout the entire mass of the stone. Expense can hardly stand in the way of experiments in this matter, for ter-fluoride of silicon is readily obtained by boiling together washed sand, or broken glass, and Derbyshire spar in common oil of vitriol. The gas could be conveyed or collected in the manner used by chemists. Should, however, it become necessary to invent a more simple plan of operation, the creation of the want would be but the forerunner to its accomplishment, as has been so often the case. According to Mr. Ansell, there would be little or no practical difficulty in applying this plan to completed buildings.

THE SEWAGE QUESTION.

Kingston and Surbiton.—A special drainage committee was lately appointed by the borough council of Kingston-on-Thames, to inquire into the best way of disposing of the sewage of the borough which now runs into the Thames. The report of the borough surveyor, Mr. Charles Slagg, to the committee on this subject, has now been made and printed. He proposes to use the surplus water at Teddington Weir in the disposal of the sewage, and thinks it advisable that the Sewage of Long Ditton, Thames Ditton, East and West Molesey and Hampton should be similarly dealt with, by making use of the fall of water at Hampton Weir. For Kingston and Surbiton he suggests the formation of a reservoir and outfall near Teddington Lock, and irrigation of lands in the neighbourhood by conveying the sewage beneath the soil in reverse drain-pipes, or semi-cylinders, with serrated edges, and topped by flat tiles, so that the liquid sewage will pass through into the soil, a layer of gravel intervening. Every three or four years a ripping-plough for the purpose should lift and clean these pipes, throwing the sediment on the soil to be ploughed into it. The drains should be about 12 ft. apart, and 1 ft. or less below the surface. The sewage on this plan would be conveyed direct to the roots of the crops, and the surplus moisture would of course be drained off clean. The surveyor proposes to deal with 300 acres in this way to begin with. The total cost of the system he estimates at 29,180*l.*, and he anticipates not only that all expenses will be covered, but a profit ultimately reaped.

Reading.—The pressure of the great question of the disposal of the sewage equally affects this town. The Thames conservators are here threatening as well as elsewhere. The borough surveyor, Mr. W. H. Woodman, and consulting engineer, Mr. John Lawson, have made a joint report to the local drainage committee, in which they propose a new scheme of drainage, at an estimated cost of 49,000*l.*, with outlet works near Blake's Lock, and a sewage farm of 387 acres at Lower Earley, Sonning; the soil to be irrigated by the sewage on the South Norwood and Worthing system.

NEWS FROM SANDRINGHAM.

Great progress has been made during the last few weeks in completing the new kitchen and offices, in expectation of a visit from their Royal Highnesses the Prince and Princess of Wales. This wing, which is built of Car stone, and white brick dressings, is divided from the Hall by a new block of building at present in an unfinished state, but is temporarily connected by a covered way. The portion now completed consists of the kitchen, 30 ft. by 23 ft., and 19 ft. high, and is fitted up with every modern appliance for cooking, by Messrs. Adams & Son, of London. The scullery adjoins, and is of the same height as the kitchen. The remaining portion of this wing extends at right angles with the mansion, and contains confectionery and pastry rooms, kitchen-maid's and footmen's room, and at the end a servants' hall of ample dimensions; out-buildings are again continued from this, consisting of washing-rooms, brushing and boot-cleaning rooms, and a pump-room. An iron tank, holding 3,000 gallons, is placed over the scullery for the supply of water to this part; and a 2½-inch main leading right through the building, with hydrants at various points, will furnish a considerable supply in case of fire.

Gasworks have been erected by Messrs. Walker, of Donnington, Shropshire, near the farm buildings, and the mains laid through the grounds to the hall, also to the residence of Sir W. Knollys and the Equerry's Cottage in the park. The lighting of the new wing is completed. It is proposed ultimately to light portions of the grounds with standard lamps, the Norwich gates, &c.

The old conservatory adjoining the house is being rapidly converted into a billiard-room, and an American bowling alley, 100 ft. long, is being built: the wall on one side is of concrete, 18 in. thick, and has every appearance of being as hard as a rock. This alley and the billiard-room will be lighted with gas.

The intermediate block, now in course of erection, will consist of a large room, 30 ft. by 18 ft., to be used as the steward's dining-room, a housekeeper's room, linen-room, housemaid's sitting-room, butler's department, strong-room, coffee-room, &c., with dormitories over for female servants; a basement story runs under this portion of the building, and will be fitted with heating apparatus, wine, beer, and coal cellars. It is anticipated that this block will be roofed in by Christmas.

The whole of the building works have been carried out by Messrs. Goggs, contractors, of Swaffham, under the direction of Mr. Humbert, architect. Mr. Schofield is clerk of the works.

THE WARMING AND VENTILATING OF BUILDINGS.

Mr. Constantine, known as proprietor of the Turkish Baths, in Manchester, has given much attention, with a view to obtain the best descriptions of apparatus for air-heating that could be procured. Some of these failed, from the constant tendency of the metal to superheat and overdry the air; others consumed an excessive amount of fuel, and rapidly wrought their own destruction. From defective internal arrangement, the combustion was so imperfect as to permit most of the heat to pass up the chimney. There was an obvious want of sufficient internal absorbing and external radiating surface, and an utter impossibility of securing uniformity of temperature, even with the most vigilant attention. In seeking to remedy these evils, Messrs. Whitaker & Constantine have devised and patented a stove, which they find, when in operation, fully to equal their expectations. Several have been erected in and around Manchester, for warming and ventilating churches, chapels, public buildings, Turkish baths, mansions, and drying-rooms. The apparatus may be thus briefly described:—The lower portion consists of an ash-box, with fire-grate above. These are surmounted by a series of nearly flat iron arches, each being deeply grooved, to form a chamber, with an aperture at the top of each arch leading to the smoke-box. These grooves extend also down the sides, and each is a separate casting, so as to be easily replaced, if necessary. They are fastened together by a peculiar joint, which is said to admit of expansion and contraction without risk of fracture. Fire-clay is used for projecting the flame into the convoluted flues, and for ensuring slow and uniform combustion of the fuel, and also for preventing superheating of the air, and at the same time protecting the castings. A stove on this principle, large enough for a small chapel, does not consume, according to the patentees, more fuel than an ordinary sitting-room fire; while, in consequence of the slow combustion, it only requires attention at long intervals. A circulating boiler could be fixed in the convoluted stove, without interfering with its use as an air-warmer.

ST. MARK'S, AT MARSKE.

The new Church of St. Mark was consecrated by the Archbishop of York on Thursday, the 17th October. Owing to the old church, St. German's, being inadequate to the increasing population, the Church of St. Mark was commenced, under the liberal patronage of Lord Zetland and a zealous committee.

The new church is a spacious and substantial building of the Early French period, to seat 705, all being free. Dimensions of nave, 76 ft. by 31 ft.; chancel, 30 ft. by 23 ft.; north and south aisles, 76 ft. by 13 ft., with an elegant and substantial tower on the south-east corner, and a spacious porch on the south-east side. The principal entrance is from the west, which forms a semi-porch with rich moulded doorway and carved capitals. The exterior is all built of pitched-face blocking, "light sand stone," from

Lord Zetland's Marsh Quarry; the windows of aisles being double lancet, having bar arches, with bases, shafts, and caps, &c., those to clear-story being sexfoil, and a beautiful rose window in the west end, filled in with cathedral glass. The east window is of stained glass, executed with great taste by Heaton, Butler, & Bayne, London, the gift of the tenantry to the memory of the late Countess of Zetland.

The main arcade in the interior springs from circular columns, which have carved capitals and bases of the same period. The lining is pressed bricks throughout, relieved with stone bands with good effect. The timber of the roof is all fir, constructed on the circular-ribbed principle, springing from stone and wood corbels, with ornamental hammer-beams, and boarded diagonally; that of the chancel forms a wagon-head ceiling, with moulded ribs. The benches are all red deal, stained and varnished. There is tile paving in the chancel, Maw's, of ornamental design; in the passages, red and black Staffordshire, neatly arranged. The heating apparatus was supplied by Messrs. D. & E. Bailey, London.

The contractors for other portion of the works was Mr. Wilkinson, Coatham. The entire cost was upwards of 4,000*l.*, against which there were 1,000*l.* subscribed by the parishioners, and Lord Zetland presents the remainder. It ought also to be added that Mr. J. Pease contributes an illuminated clock and bells. The works have been executed from designs by Mr. F. P. Cockerell, London, and under the superintendence of Mr. G. Carter as clerk of works.

THE ARCHITECTURAL ASSOCIATION CONVERSAZIONE.

The opening meeting and *conversazione* of the twenty-sixth session of the Association were held on Friday evening, the 25th ult., at the House in Conduit-street.

In the rooms were displayed a number of paintings and works of art. The drawings of the successful competitors for the various prizes offered by the Association were also exhibited.

The attendance of members and visitors was more numerous than usual, and included a number of ladies.

The chair, having been taken by the newly-elected president, Mr. R. Phené Spiers, it was announced that letters had been received from Sir F. Grant, Mr. Tite, M.P., Professor Donaldson, Mr. Godwin, and other gentlemen, expressing their regret at not being able to be present.

Mr. E. G. Tarver read the report on the class of design, which stated that the first prize had been awarded to Mr. G. Vialls, and the second equally between Messrs. E. Lee and Metcalfe.

Mr. C. H. F. Lewes announced that the prize for figure drawing in the Life School had been given to Mr. E. H. Bearne.

Mr. J. D. Mathews (hon. secretary) brought up the report of the judges on the Architectural Union Company's prize, which recommended that half of the amount should be awarded to Mr. W. R. Tilling.

Mr. T. Blashill intimated on behalf of the judges that the prize of 5 guineas, offered by the out-going president (Mr. R. W. Edis), had been awarded to Mr. E. Lee.

The successful competitors having received their respective prizes, the President delivered the inaugural address, quoted on another page.

At the conclusion,

Professor Hayter Lewis ventured, both as a Fellow of the Royal Institute of British Architects and as a member of the Association, to congratulate the meeting on the prosperous and satisfactory condition of the Association. It was from the junior members of the profession that the Institute must draw its life-blood, and no machinery could be better devised for its circulation than an Association like that which had begun another session that evening, because all its members derived benefit from an interchange of knowledge, from healthy competition among themselves, and from a salutary system of self-government which was not too proud or too self-reliant to invite the senior members of the profession to visit them occasionally, and give them the result of their experience. He quite agreed with what had fallen from the president in reference to the necessity of sketching; and he thought he might paraphrase the words of Bacon, and say that sketching made a correct man; for it would be impossible for the student fully to understand the beauties of nature if he did not carefully sketch. It was, in fact, careful sketching which accustomed the hand as well as the eye to appreciate the beauties of Nature and Art. The jointing of the masonry, the forms and shadows of the mouldings, the light tints of colour, were all of importance, and might be overlooked without a sketch. He believed it was Mr. Street who, when dilating on this subject, said that, when the student had made a very good sketch, the best thing he could do with it would be to put it into the fire; and Professor Kerr, who was present on the occasion, thereupon observed, with much propriety, that for his own part, he would much rather the sketch were given to him than burnt. That which Mr. Street, however, no doubt intended, was, that when the student had made a careful sketch, he had got as much knowledge through its agency as could be acquired on that particular subject. At University College he found that the students failed most in sketching, and to improve them in this respect the questions were framed as much as possible so as to get the answers in sketches; for he felt no doubt that a few lines carefully drawn, and with a few references, would give a better description than any amount of writing. The reason of the failure to which he referred was that the younger students frequently endeavoured to do too much in too little time. He would venture to throw out as a suggestion, that it might be desirable to set aside, in some of the classes, half an hour or so, to be devoted to putting on paper thoughts upon some cognate subject suggested on the spur of the moment, and then comparing these notes. This would, he thought, be the means of eliciting a good deal of practical information. This sort of inquiry, even into the most familiar subjects, often revealed the somewhat discouraging circumstance that one knew very little indeed about them. But, on the other hand, this appreciation of one's own ignorance was most useful because it put the student on the high road to inquiry and reflection, and then after a little work it became quite a pleasant surprise to him to find that he knew so much. With regard to figure drawing from the life, he was happy to say that at University College it was now in contemplation by the Council to establish classes for drawing from life models under the instruction of competent artists. He had been in communication on this subject with the head master of the college drawing school (one of the most successful existing), and also with a gentleman well known in that room, Mr. Poynter. In the course of his address, the president had referred to the Institute; and with reference to this subject he (Professor Lewis) felt bound to allude to the discouraging circumstance that so few competitors came forward for the prizes which it offered. If, on the other hand, there were obstacles which were susceptible of removal, he was sure the Council of the Institute would be glad to consider them, and to act upon any well-considered suggestions which might be offered with that view. There was only one other point to which he would refer, and that was the modern style of architecture in France, noticed by the president. For his own part, he could not agree with the latter in his admiration of that uniformity, and he did not think foreigners themselves were enamoured of it, because he found it extremely difficult to get photographs of their modern public buildings. In conclusion, the speaker moved a vote of thanks to the president for his address.

Professor Kerr, in seconding the vote, availed himself of the opportunity to add his congratulations to those of the last speaker, on the progress which the Association had made for at least one-and-twenty years. The Association had steadily proceeded in one direction,—namely, the instruction of junior architects, and in this way had effected much good. The Institute had been referred to both by the President and by Professor Hayter Lewis, and all he would say on the subject was, that if the student depended upon the Institute for education, he would not be able to realize his expectations, for it would be perfectly impossible for it to do much more than it did. The little success which had attended the voluntary examination scheme, got up, as it was, at considerable expense, and in a spirit of perfect sincerity of purpose, was a proof of how little the Institute could do in the way of education. The best means of education, apart from office-work, was that furnished by the Association, and it was a gratifying illustration of the good which had been effected by it to find that more than a dozen of the best designers of the day had been educated by it.

Mr. T. Roger Smith observed, with reference to the tinting of the architectural drawings at the Paris Exhibition (to which allusion had been made by the president), that those exhibited by Mr. Waterhouse, and which obtained the only grand medal awarded to English contributors, were all tinted by that gentleman's own hand.

In the course of the evening there was a concert of instrumental music, by Messrs. T. H. Waight, Svendsen, Weiner, and Schmeyer.

COMPENSATION CLAIM AT LIVERPOOL.

The premises of an Italian warehouseman being required for the Central Station and Hotel, in Ranelagh-street, a claim for loss of property and business has been made against the Manchester, Sheffield, and Lincolnshire, the Great Northern, and the Midland Railway Companies. The original claim sent in was 12,088*l.*, being 6,820*l.* for leasehold land, messuage, shop, warehouse, stable, hereditaments, and premises; 1,023*l.* compensation for compulsory sale, severance, and damage; 3,692*l.* for loss or destruction of business; 395*l.* loss on sudden realization of stock-in-trade, and 158*l.* damage, compensation, and reinvestment. Subsequently an amended claim was put in for 11,000*l.* odd, which was resisted by the companies. The jury viewed the premises, which were shown by Mr. Brattan, architect and surveyor, of Bickenhead, on behalf of the claimant, and by Mr. J. Arscott, for the companies. On returning into court a long consultation ensued between the legal gentlemen, and an award of 7,500*l.* was accepted, the claimant, who will occupy the premises for other twelve months, retaining the fixtures, which were valued at 500*l.*

DARLINGTON WORKHOUSE COMPETITION.

Sir,—Noticing a letter in your last from "An Old Subscriber," which conveys the impression that the guardians have not honourably fulfilled their conditions, by withholding the premium advertised, I think it only fair to inform your readers that so long ago as December 24th, 1866, the committee selected my design as the best. A question, however, arose at the same meeting respecting the tenure of the land, and the Board have been nine months negotiating respecting it and other sites, the question as to altering the old or building a new house depending on the result. Having failed to make a satisfactory arrangement as to the old property, the guardians have at length purchased a new site, and have paid me the premium in lieu of employing me to carry out my design.

I do not see what ground of complaint your correspondent has, except that the committee did not appreciate his design as highly as he himself appears to do.

I think if any one has ground of complaint, it is I, that, "owing to circumstances over which" no one "had any control," I should only receive a small premium instead of a good commission, and have to compete again for the latter.

J. P. Pritchett.

*** We do not agree with Mr. Pritchett, that our first correspondent has no cause of complaint: his actual complaint remains wholly unanswered by this letter.

HOLBORN BAR AND VIADUCT.

It is evidently too true that, as this Journal has so frequently remarked, in all our endeavours to effect improvements, as in Gresham-street, &c., they have been botched, and simply in effect; that a defined plan is not previously fairly laid down and accurately adhered to. Instance the long-sought for removal of that unsightly block of buildings known as the Holborn Bars, which has at length yielded to common sense, if not good taste and judgment, exposing, as it now does, the very irregular, winding frontage of the former court-houses,—some of which have been recently expensively rebuilt on their former very distorted line. Surely the Board of Works, and the Local Board, must have long since foreseen the certainty of the removal at no distant period of this long-disgraceful excrescence in one of our greatest thoroughfares, and ought to have been empowered to enforce upon "the give-and-take principle" to arrange these frontages upon their rebuilding *to a uniform line*, ranging from the end of Staple's Inn buildings to the upper houses of the late Middle-row, or even to Southampton-buildings, thus giving or taking; in no instance more than 1 ft. either way, but affording an undoubted improvement. To the great credit of the engineer of the Thames Conservancy, this system is now always enforced and adopted, in the revisal of all wharfs, piers, and embankments up and down the river, on whose plan a bold and sweeping line is defined, bearing no doubt the motto, "Thus far shalt thou go, and no further," but with permission, where necessary or beneficial, to recede *ad libitum*. The fine gin-palace recently erected all askew upon the above site must strike with regret for the bungle which has been committed.

H. B.

TOWN *v.* COUNTRY.

Your correspondent "Rus" thinks it clear that—

"God made the country and man made the town,"

because the town contains Houndsditch and Bethnal-green. That the country is wholly God's handiwork he thinks none can doubt; while equally certainly the filth, squalor, overcrowding, and disease manifest in Houndsditch and Bethnal-green prove the town to be man's work.

If, then, all filth, squalor, overcrowding, disease, and similar offences against our ideas of order be man's production, where does "Rus" classify the storm that tears up the mighty trees like twigs and flings them best upwards on the ground, the lightning that splits and burns the oak, the countless creeping grubs that spread their hateful film over hedge and thorn-tree and nip off every green leaf, the insidious earwig that in her ignorant search after food cuts off the leader of the plant and stops its summer's growth, the unseasonable frost of an early spring which in

seeming satire and contempt strews the ground with tender shoots and makes the early tinge of green a broken promise, the universal law of nature by which the strong tree oppresses its weakly neighbour; the raven picks up for its morning meal the tender rabbit, with its nerves, its limbs, its wonderful eyes, when surely any disorganised lump of matter were as suitable food; the rabbit himself, who wages ceaseless war on every green thing, and would soon depopulate the earth were there not dealt out on him a war as ruthless? Illustration is as endless as the face of nature is vast, that the law established everywhere is the one which gives its filth, squalor, overcrowding, and disease to Houndsditch and Bethnal-green—the power placed in the seemingly irresponsible hands of the strong over the weak. If, indeed, in the reduction of this power to the rule of right and justice, is made manifest the work of God, we see such manifestation clearer in Houndsditch and Bethnal-green than in the country, for there this mighty work is plainly in hand.

Bastiat is surely right, and not "the amiable but morbid poet;" and these injustices,—these offences to our sense of what is just and good,—we were wise to attribute to the unamiable conditions of early man, who, with God's full knowledge and in the intention of His unerring wisdom, must pass through the faulty stage of ignorant immaturity so offensive to our aspirations before he can step out into the clean and wholesome breadth of a manhood achieved by God through the pages of the *Builder* and other such manifestations of handy-work we justly call man's own, if, indeed, in the highest sense, the creature can claim anything of his Creator. H. F.

FROM SCOTLAND.

Edinburgh.—Designs for new Free St. George's Church have been prepared by Mr. David Bryce, architect, for a site secured at the angle of Shandwick-place and Stafford-street. The ground was occupied by houses, and in the purchase of these something like 13,000*l.* were expended. The design is in the Palladian style, and will possess features new to the architecture of the city. The ground has been cleared, and already some progress has been made with the masonry. The cost of the building, exclusive of the site, will be from 17,000*l.* to 18,000*l.*, so that the entire expenditure will not be less than 30,000*l.* The price obtained for the old church was 15,000*l.*, so that the congregation will have a like amount to raise; but a large proportion of the sum required has been subscribed.

Glasgow.—A new Home, erected at Lochburn, near Maryhill, for the inmates of the Glasgow Magdalene Institution (in which institution the original Magdalene Asylum of Glasgow was merged in September last) has been formally opened. The house is situated on the slope of a slight eminence, about 300 yards north from the canal, at Lochburn. The front of the house faces the south. It is three stories high, the ground floor being occupied by such apartments as the directors' room, waiting-room, business room, matron's room, and the upper floor by dormitories. At each end of this range of building there is a staircase, giving access to the various floors, and from these extend backwards two ranges of buildings two stories high, the ground floors being occupied as work-rooms, and the upper floors as dormitories. The space between these two pavilions is roofed over, and occupied as the dining-hall and the chapel, which, being only separated by folding doors, may, when desired, be used as one large apartment. Well lighted corridors extend along both sides of these apartments, which have doors to both. There is a bath-room at the foot of each of the principal staircases. The dormitories are arranged to accommodate 100 inmates. Immediately north from the centre of the building there is a large range of buildings of one story in the form of the letter T, the gable of the part represented by the lower limb being about 30 ft. back from the kitchen. This part is the laundry. At the carriage-entrance is a lodge. The whole work has been carried out from the designs of Mr. Honeyman. The following were the contractors engaged:—Masons' work, Messrs. Lyall & Leckie; joiners' work, Messrs. M'Craw & Kay; plumbers' work, Mr. W. Reid; plasterers' work, Mr. A. Campbell; and slaters' work, Messrs. James Stewart & Sons. The cooking apparatus was fitted up by Messrs. A. & J. Nisbet; and the steam-boiler and fittings of washing-house and laundry by Mr. Purnell. The clerk of works was Mr. William Kent. On an adjoining site the new Girls' House of Refuge, also designed by Mr. Honeyman, is rapidly approaching completion.

Balmoral.—The colossal statue of the Prince Consort, by Theed, has been uncovered at Balmoral. The Queen and other members of the Royal Family were present.

Alloa.—The construction of new waterworks at a cost of 3,000*l.*, has just been brought to a successful completion. Messrs. Chalmers & Mackenzie, Dunfermline, were the contractors.

Port Glasgow.—The new waterworks here have been opened by the authorities. The works, which were done by Mr. Gale, C.E., Glasgow, have been in progress for the past year and a half, and consist of a reservoir, near the farm of Laperstone, and a filter and tank at the farm of Parkhill. The reservoir is 33 ft. above the mean level of the sea, covers an area of 26 acres, and is bounded by two embankments. The reservoir will contain 8,800,000 cubic feet of water, and is estimated to supply 12,000 people with water for a period of 100 days without rain, and 30 gallons per head per day. The cost of the works is as follows:—Reservoir, 4,339*l.*; conduct filters and tank, 22,301*l.*; pipes and pipe laying, 4,720*l.*; lands, engineering charges, &c., 5,000*l.* Total, 15,289*l.*

CHURCH-BUILDING NEWS.

Strathfieldsaye (*Hants*).—The church of St. Mary the Virgin, Beech Hill, has been consecrated. The site was given by Mr. Henry Lannoy Hunter, and the cost of the church (upwards of 2,000*l.*) has been defrayed by Mr. Hunter's sister, Mrs. Forbes, and her daughter, and son-in-law, the Rev. E. H. Landon. Mrs. Forbes also presents 4,000*l.* for the endowment. The site is an elevated one at the south-east corner of the "Seventeen Acre" Field, on the Home Farm. The architect was Mr. W. Butterfield, of London. Messrs. Wheeler Brothers, of Reading, builders, were the contractors. The church is built of red brick, flint, and Bath stone on the outside, and of red, white, and grey brick and Bath stone, in patterns, on the inside. It consists of a nave and chancel under one continuous roof, with a short north aisle opening to the nave by two arches, an organ chamber and vestry also on the north side, and a south porch chiefly of oak. The church is covered with tiles, and has a belfry covered with oak shingle at the west end, containing a peal of bells. A traceried screen of oak and walnut wood, with gates, divides the nave and chancel. The seats are low and open, and of one uniform character throughout. The windows are generally foliated lancet lights in different combinations, and the style of architecture may be considered as that of the thirteenth century. Some stained glass windows are in preparation, and will shortly be fixed.

Newmarket.—St. Mary's Church, Newmarket, has been enlarged. It was at first resolved simply to add a north aisle, or rather to convert the transept into an aisle, terminating at the east end in an organ chamber, which is in fact an extension of the aisle beyond the line of the chancel arch. In addition to this it was decided to build a vestry on the north side of the chancel. Mr. J. F. Clark was the architect, and Mr. Andrews (of Bury) the builder employed. After a time it was thought that as these extensions would only provide about 100 additional sittings, and there was already a gallery on the south side of the church, it would be better to place a gallery above the new aisle also, and this has therefore been done, so that the recent alterations afford accommodation for about 300 additional persons, making the total number of sittings somewhere about 900. The new aisle is lighted by four Perpendicular windows, in harmony with those on the opposite side of the church, two of them being entirely new, whilst the other two, previous to the alterations, lighted the transept and the west end of the nave. The aisle has been fitted with benches of stained deal corresponding with those in the body of the church. The total cost of the alterations is about 1,200*l.*

Sealand (*Cheshire*). — St. Bartholomew's Church, Sealand, has been consecrated by the Lord Bishop of St. Asaph. The church,—which is situated on the River Dee Company's estate, in the parish of Hawarden,—is about one mile from Queen's Ferry and five from Chester. The site occupied by the building was given by the River Dee Company, in addition to which they have contributed 1,250*l.* The total amount of subscriptions raised towards the building fund is 2,131*l.*, and up to the present time there has been an outlay of 2,300*l.* Only a small portion of the oak seating is at present complete, the nave being arranged with chairs. The church affords accommodation for 300. The heating is by Porritt's underground stove. The east window is filled with painted glass, by Messrs. Hardman & Co., of Birmingham. The church, which is in the Early Gothic style, is constructed of stone from the Helsby quarries, the interior being finished with chiselled ashlar. The plan consists of nave, 62 ft. by 26 ft.; chancel, 24 ft. by 17 ft.; a small transept on the north side is to contain the organ, and the vestry is under the tower on the south side of the chancel. The tower is 65 ft. high, surmounted by a metal cross, but at present only contains one bell. The whole of the roof timbers and doors are of oak. The spaces between the timbers of the chancel roof are decorated with designs in black and gold on a blue ground. The architect was Mr. John Douglas, of Chester, and the builder Mr. Robert Bellis. The decoration of the chancel was executed by Mr. Robert Ellis.

Slough.—It has been resolved at a public meeting of the parishioners to erect a new parish church, retaining the old one as a mortuary chapel or a chapel-of-ease. A committee has been appointed, and a subscription-list opened. A site has been offered.

Birmingham.—The chief stone of St. Gabriel's Church, Bordesley-street, has been laid in the presence of a large concourse of spectators. This church is the second that is to be erected by the aid of the Ryland fund. After the ceremony, and (of course) a luncheon which followed, the company adjourned to witness the casting of five church bells, a branch of manufacture which has only lately been revived in Birmingham, by Messrs. Blews, who have established a foundry capable of turning out at one casting a peal of bells 9 tons in weight. Those founded on the occasion were two of them for King's Norton Church, one of which, the seventh in the peal, weighs about 15 cwt., and the other, the treble, about 6 cwt. The other three were for Rock Church, near Bewdley, one, the tenor, about 13 cwt., the third bell 8 cwt., and the treble bell 6 cwt. Our old correspondent, the Rev. H. S. Ellacombe, was one of those present at the founding, and expressed his approval of the arrangements of the foundry.

Thorncombe (*Dorset*).—A new church has been consecrated here. The old one had been allowed almost to crumble to dust, and was dangerous to hold service in. It was accordingly decided that the old building should be pulled down, and that a new one should be erected upon a site presented by Mr. Bragge. Plans and specifications were drawn up by Mr. James Mountford Allen, architect, Crewkerne, under whose superintendence the edifice has been erected. The new church consists of nave, north and south aisles, Ford Abbey aisle, chancel, and north and south chancel aisle, and a tower at the west end. The walls are built of a portion of the material used in the old church, and limestone found in the neighbourhood, with facings of Ham-hill stone supplied by Mr. Charles Trask, of Norton-sub-Hamdon. The aisles are divided from the nave by arches resting upon pillars of Ham-hill stone, ornamented with Bath stone capitals. The church is of the Perpendicular style of architecture. The windows are characteristic of the period, the model being one of the old cloister windows at Ford Abbey, in conformity with the expressed wish of its former owner, Mr. Miles. The nave is lighted on the north side by four three-light windows, the south aisle having two three-light windows, a door, and Ford Abbey aisle. At the west end of the aisles are two two-light windows. The roof of the nave is open, of stained deal, with plastered panelling. An arch of Ham-hill stone, supported on Bath stone capitals, divides the nave from the chancel, which is raised two steps. The chancel is lighted by a five-light window, with pointed tracery. On the south side is a two-light window, by O'Conner, representing St. Peter and St. Paul, with medallions of the conversion of St. Paul and the release of St. Peter from prison. The tower is divided into three stages with string courses and bell turret on the north side, above which rise the cross and weathercock taken from the old church. The tower has three two-light windows and a peal of five bells, which have been rehung. The nave is floored with blue Keinton stone, and fitted with open seats of stained deal. Open sittings formed of the old church pews fill the north and south aisles. The chancel stalls are of oak, as are also the fittings of the Ford Abbey aisle. The whole of the work has been carried out by Mr. Davis, of Langport, under the superintendence of the architect. The entire cost of the erection is about 4,000*l.*

Standish (*Gloucestershire*).—The church here has been re-opened, after a restoration, which, with an organ, has cost 1,370*l.* Mr. St. Aubyn, of Gloucester, was the architect employed, and Mr. O. Estcourt, of Gloucester, the builder. The stone-tile roof has been entirely renewed. The walls have been cleaned and pointed, inside and

out: the steeple is to be pointed, and also repaired at the top. The windows have been made new in the old style, and filled (by Messrs. Lavers & Barraud) with plain glass, tinted green in the borders. The flowing tracery of the east window is similar in character to the west window of York Minster. The nave is ceiled with the ancient oak panels of the fifteenth century, with carved ribs and bosses, which have been cleaned and restored. The chancel has an open stained deal roof, nearly 40 ft. from the floor. The flooring is of Painswick stone throughout. The high oaken pews have been cut down, and cleaned; the oaken pulpit has yielded material for a lectern; and the chancel is fitted with choir seats. The communion space is paved with Godwin's tiles. A rood-loft stair was discovered in the south corner of the nave, and has been opened.

DISSENTING CHURCH-BUILDING NEWS.

Hythe.—The Building Committee connected with the New Congregational Church and Schools have opened the tenders sent in: they were as under:—

	Church.	Schools.	Total.
W. J. Adcock	£2,185 14 ...	£698 14 ...	£2,884 8
H. Unwin ...	2,156 7 ...	709 9 ...	2,865 16
J. Bowley ...	2,229 0 ...	700 0 ...	2,929 0
J. Waddell ...	2,192 17 ...	652 2 ...	2,844 19
J. Q. Petts ...	1,977 14 ...	668 14 ...	2,646 8
R. Hazell	1,925 0 ...	625 0 ...	2,550 0

Mr. Hazell's tender being the lowest, was accepted, subject to some inquiries to be made by Mr. Gardner, architect.

Richmond.—The memorial stone of a new Wesleyan School-Chapel has been laid here by Mr. P. B. Hall. The new building has been commenced, adjoining the Kew-road. It is Early Gothic in style, and consists of a chapel to seat 400 persons, with two class-rooms attached. The whole is designed to serve as a school when a larger chapel, for which space has been reserved, is built. The exterior is of picked stocks with Bath stone tracery and dressings. The roofs are covered with coloured slates, and surmounted with crested ridging. Mr. E. Hoole, of Craven-street, is the architect. The work is being carried out by Mr. Hookham, of Kentish-town, at a cost of 1,120*l.*

Wrexham.—The new Welsh Calvinistic Chapel, recently built between the town and the railway-station, has been opened. There are on the Hope-road half a dozen places of worship within a stone's throw of each other, which have been built at a cost of above 20,000*l.*, the outlay on the latest being about 5,000*l.* The style of architecture adopted in this building is the Romanesque, the material being brickwork, with ornamental bands of red and black bricks and moulded stone dressings for all the more important parts. The principal front consists of a gable, flanked by two square towers, terminating in slated spires, which rise to a height of about 100 ft. from the ground. The lower portion is pierced with three small deeply-recessed lights, over which, at the level of the gallery-floor, rises a group of three large moulded windows, filled up with tracery, the pillars dividing these windows having polished red granite shafts, banded with stone and carved capitals. Entrance is obtained by means of two porches, one in each tower. These porches project about 3 ft., and terminate in gables, supported on polished red granite columns, having carved bases and capitals. A wheel-window, 11 ft. in diameter, filled with plate-tracery, is placed in the east gable over the pulpit. The interior of the chapel is about 80 ft. long by 43 ft. wide, and rises to the height of 35 ft. from the floor to the ceiling. It is galleried on both sides and at the west end. Seats are provided for about 800 persons. All the windows are filled with quarry cathedral-glass, having borders, the tracery being worked in patterns of different tints. A vestry is provided under the east end of the chapel. The building is to be heated by hot-air from a Gill-stove placed in the basement. The chapel is placed back from Hope-road about 30 ft., and at the street-line is built a low ornamental-dressed stone wall, with two entrance-gates, opposite the porches; and ornamental cast-iron railing is to be placed between the gate-piers. A dispute with the borough surveyor as to this wall was settled by rebuilding the wall. The chapel has been built from the designs and under the superintendence of Messrs. W. & G. Audsley, architects, Liverpool; by Messrs. Thomas & Son, builders, Menai Bridge. The glass was manufactured by Messrs. Edmundson & Son, of Manchester; and the carving was done by Mr. Stirling, of Liverpool.

Crewe.—The chief stone of a new Welsh Presbyterian Chapel has been laid in St. Thomas-street, off West-street. The plan and elevation of the proposed edifice have been prepared by Mr. Eli Frost, of Crewe, architect; and the builder is Mr. Thomas Lee. The cost of erection will amount to about 600*l.* The building will be in the Gothic style, having a high-pitched roof. The front will consist of blue, red, and buff bricks, with stone dressings.

STAINED GLASS.

St. Andrew's, Smethwick (Birmingham).—The first light of a memorial window, to be dedicated "to the Glory of the Triune God, and in Memory of the Holy Dead who once worshipped in St. Andrew's Church," has been placed in the large chancel window. The colours are rich and brilliant, and the countenance of the saint, who is represented with uplifted hand, in the act of preaching from the knotted cross, to which, tradition informs us, he was tied for three days, is expressive. Nearly the whole cost of this light has been collected by the younger members of the congregation. It is to be regretted, however, that sufficient money has not been raised to complete the filling in of a window in one of the largest chancels in the neighbourhood, and so admirably adapted for this kind of ornamentation. The light has been executed from the design by Mr. T. W. Camm.

Haseley Church (near Warwick).—The east wall of the chancel of this church has been taken down, and carried out, to enlarge the church, and a new window built up,—Mr. Kibler, of Wellesbourne being the contractor,—and the openings of the window have been filled with stained glass, executed by Mr. Holland, of Warwick, and erected as a memorial of the late rector. It contains three openings, and the design is arranged in medallions with the Annunciation, Nativity, and Crucifixion, upon grisaille groundwork, with emblems in tracery.

St. Giles's (Willenhall).—The north chancel window of this church has been filled by Mr. Holland, with stained glass, representing Christ Blessing little Children, with ornamental groundwork of the vine foliage, and an angel in the tracery, bearing a shield, with the arms of the present rector.

Gloucester Cathedral.—Soon after the death of the late Mr. Francillon, Judge of the Gloucestershire County Courts, the registrars and other officers resolved to erect to his memory a window in this cathedral. The work was entrusted to Messrs. Hardman, and was completed a short time ago. The window selected was the western one of the south walk of the cloisters. The chief part of the window is divided into six lights. In three of these the Saviour is represented rising from the tomb, and holding a banner; and on the sides are two Roman soldiers in amazement, and another asleep; in the other three, the Angel addressing the devout women bringing spices to the sepulchre. The upper lights are filled with coloured glass.

Wapley Church.—A stained-glass window has been placed in this church to the memory of the late Sir William Codrington, bart., M.P.

PATENTS CONNECTED WITH BUILDING.

IMPROVEMENTS IN CONSTRUCTING QUAYS, JETTIES, PIERS, SEA WALLS, AND BREAKWATERS; IN THE FORMATION OF RESERVOIRS, DOCKS, BASINS, COAST HARBOURS, HARBOURS OF REFUGE, LIGHTHOUSES, AND SEA BATTERIES; APPLICABLE ALSO FOR THE RECLAMATION OF LAND AND FOR THE BUILDING OF BRIDGES.—*H. Buss, M.D.* Dated January 11, 1867.—This invention comprises, among other features, the construction in a suitable dock of a framework of iron, efficiently supported by internal framing, and covered externally on every side but the top with sheets of iron so riveted to the said framework as to form a watertight vessel. The precise shape of such vessel will vary according to the structure it is designed to erect. When a jetty, pier, breakwater, or sea battery is to be constructed, the transverse section of such watertight vessel will be of a pyramidal form, truncated at the apex, of the full height and width of the intended structure, and in length varying according to need from 100 ft. to 1,000 ft. The ends thereof will be square, oblique, circular, or of any other suitable form. The framing of the bottom will vary according to the nature of the bed on which it is to rest. The entire iron jacket internally and externally will be coated with an incorrodible marine paint. Each pyramidal vessel, when completed, will be floated from the dock into open water, and be so weighted with blocks of stone, rubble, or concrete, as to sink it to a convenient depth. Next, it will be towed to its destination, and have as much water admitted as will compel it to sink down to its suitably-prepared bed; and, after it has settled down in position, sufficient blocks of stone, rubble, or concrete will be introduced, to prevent, by their own weight, the vessel being filled up at high water. The contained water will be withdrawn, and, provision being made in the internal framing, each pyramidal segment will, when deemed necessary, be invariably fixed to its sea or river bed by piles, iron bolts, screws, or otherwise, being driven through the bottom into its bed, and also into the end of the next segment. Finally, concrete will be poured in as quickly as possible until each pyramidal vessel is filled therewith. In some cases it will be more expedient, when the pyramidal vessel has arrived at its destination, to sink it at once by filling it up with concrete, instead of overweighting by the introduction of water as above.

WINDOW-SASHES AND WINDOW-FRAMES.—*T. Bullivant.* Dated 31st January, 1867.—This invention has reference to the construction and arrangement of sliding sashes and sash frames, and in the adaptation of roller-blinds thereto, with the view of rendering the sashes air-tight, and preventing any rattling or shaking of the same, as also readily removed for being cleaned or otherwise, and in fitting the roller-blinds within the head of the said sash-frames so as to protect the blinds from dust or dirt when not in use; and consists in forming the sash-frames with vertical metallic grooves, or otherwise, in pulley styles, in which metallic guides attached to the pulley-cords and weights on each side of the said frames are caused to work in such manner as to admit of the sashes aforesaid being taken out and replaced when required through the medium of fixing screws inserted within the sash style, flexible material being employed for covering the said metallic guides, so as to give a smoother sliding action to the window-sashes, and also to shut out the draught. By these arrangements the inner beading and parting head, together with the projecting outside linings of the sash-frames, as at present, are dispensed with. A box or cavity in connexion with the above is formed at the head of the said sash-frames for receiving the roller-blind and sash-pulleys aforesaid, a space or opening between the movable head and front moulding being left for the blind to pass through when being drawn up or down.

Books Received.

Society of Engineers. Transactions for 1866. Spon, Charing-cross. 1867.

THIS volume contains a paper, by Mr. Carl von Wessely, on "Arched Roofs" of Iron (we should prefer to have it called on "Arch-form Roofs"), which, with the discussion that followed, well deserves study. It is illustrated with sections and details of the Dublin Exhibition Palace, Derby Market-hall, Crystal Palace (Sydenham), Amsterdam Crystal Palace, and St. Pancras Station of Midland Railway (span, 240 ft.). Papers on the utilization of sewage, and on the designing of storage reservoirs, with the discussions that followed, assist in rendering this a volume of more than ordinary value. We may add, that the paper on the designing and construction of storage reservoirs (by Mr. Arthur Jacob), with its illustrations, is published by Messrs. Spon, in a pamphlet form.*

A Treatise on the Strength of Materials. By PETER BARLOW, F.R.S. A New Edition. London: Lockwood & Co. 1867.

WE have to mention the publication of the sixth edition of the late Peter Barlow's well-known treatise, revised by his sons, Mr. P. W. Barlow,

* We have before us a pamphlet on the "Practical Designing of Retaining Walls" by the same author, Mr. A. Jacob, A.B. Printed by Chas. Cooper, Lincoln-place, Dublin. 1867. It is a very valuable contribution towards the full understanding of the subject.

and Mr. W. H. Barlow, and arranged and edited by Mr. W. Humber. Professor Willis's Essay on the effect produced by passing Weights over Elastic Bars, and various formulæ for Calculating Girders, &c., are given as appendices. Mr. Humber seems to have discharged his part of the work conscientiously.

Lyra Germanica: the Christian Life. Translated from the German by CATHERINE WINKWORTH, and illustrated by John Leighton, E. Armitage, A.R.A., and F. Madox Brown. Longman & Co. 1868.

THE first of the Christmas books, and a handsome one,—a book not merely for this year, but for many. We may suppose from the appearance of this second series of translations from German hymns that the first volume found favour with the religious and art-loving public. It necessarily addresses itself, so far as the literature is concerned, to a special circle: by its artistic embellishments, however, it widens that circle very greatly. Most of the hymns are popular for singing in Protestant Germany, and date from the sixteenth century to the present time. Six of the illustrations are by Mr. Armitage, three by Mr. Madox Brown, but the great majority are by Mr. John Leighton, whose fecundity and skill, within certain limits, are very remarkable. Initial letters, head-pieces, tail-pieces, and side-pieces, display an amount of quaint invention that is never wholly found out, and suggest never-ending matter for reflection. Some of his small landscapes, that at the head of "Services," p. 71, for example, and at the head of a "Morning Prayer," p. 79, showing an avenue of trees in winter, are particularly agreeable and satisfying.

Of the designs by Mr. Armitage, we prefer the illustration of the passage, "Doth conquer sin and death for evermore," p. 19,—a large picture in little. The chief contribution by Mr. Madox Brown, is the "Burial of Christ," p. 38, which has great merit. It may be objected, however, that the head of the Saviour is detached from the body. The volume is beautifully printed, and altogether a genuine *article de luxe*.

VARIORUM.

THE *Quarterly Review* for October contains an able paper on "Trades' Unions," and one on "Science in Schools." The paper on Trades' Unions gives a review of the more salient points in the Commission evidence, and asks, as we ourselves did, "Are we not rapidly tending to the institution of caste as is found in India?" After putting the case against the trades' unions in pretty strong terms, the writer says:—

"We have by no means heard all that is to be alleged against them, and the evidence in their favour is utterly futile. We say that they injure in the most vital manner the interests of the very working class whom they are meant to aid; that they threaten some branches of manufactures with extinction, and seriously limit the diffusion of others; that they are carried on by means fatal to every right that a free country respects; that they are ruinous to the legitimate ambition of industry and merit; that they can only be conducted by a systematic breach of the law; and that they run through the whole gamut of crime, from a mere conspiracy in restraint of trade, to robbery, arson, mutilation, and murder. We do not say that they are all alike. A vast interval separates such an association as the Amalgamated Carpenters and Joiners from the Bricklayers of Lancashire or the Saw Grinders of Sheffield. But they all contain within them the germs and elements of crime, they are all founded on the right of the majority to coerce the minority, on the absolute subjugation of the one to the many, and the employment of such means as may be necessary in order to give effect to these false and dangerous principles. Is such a state of things as we have described to be tolerated in this country? Is everything which has hitherto been the pride of Englishmen to be sacrificed to the vain attempt to overthrow by brute force the most clearly established principles? Are we tamely to stand by and see these bodies ruin our trade and manufactures, and tolerate a progressive demoralisation of classes destined henceforth to have a potential voice in the government of this country, to which no limit can be assigned short of the worst and blackest of crimes? If not, what is the remedy?"

The remedy, continues the author, depends, of course, upon the state of the law. The law, he considers, is not adequate to punish such enormities, although nothing is clearer than that common law will not allow conspiracies in restraint of trade or oppression either of workmen or of masters. The alterations in the law which he suggests are these:—

"Forbid absolutely, under pain of indictment—or, better still, summary punishment before two justices—the establishment of any Friendly or Provident Society without the certificate of its rules from the registrar of such societies. Give a reasonable time to all existing benefit or provident societies to come in and register, and after that time has expired declare all such societies illegal and their members liable to punishment. Give to some suitable tribunal a power of arbitrating between the society and its members, whenever it is impossible for them to comply with the requirements of the Registrar of Friendly Societies. Declare, in affirmance of what we believe to be the common law, that all societies formed in restraint of trade (other than those combinations protected by the 4th and 5th sections of the 6th Geo. IV., c. 129) are illegal, and give to justices a summary jurisdiction against their members.

The law will then be adequate to the mischief. If it can be enforced, society will have freed itself from a great peril; dangers to our manufactures and commerce, the amount of which no man can measure, will have been arrested, and a demoralization which threatens to lower the character of the English operative to the level of the Thug of India will have been stayed: if not, we must be prepared to see our prosperity wither and perish under the ruinous influence of persons as ignorant of their own true interests as they are careless of the feelings and reckless of the interests of others."

With reference to the subject under notice, we may here incidentally allude to the important remarks of the premier on trades' unions in his recent speech at Manchester. Lord Derby characterised trades' unions, as they at present exist, as associations which endeavour not only to set class against class, but to promote ill-will amongst all classes. On the other hand, he extolled the co-operative principle, which he believed had already done great good not only in establishing habits of frugality and order, but in teaching working men to estimate the claims of capital as well as of labour. —— The almanacks and calendars are coming in: foremost amongst them and in the various well-known shapes are those of De la Rue & Co. Little books for ladies and large books for gentlemen. Indelible Diaries, Red-letter Calendars, and improved Memorandum Books. The astronomical illustration for the year shows Lunar Craters. ——Cassell's Illustrated Almanack for 1868 contains a large number of illustrations; some of them very good. —— Everybody's Year-Book (Wyman & Sons, Great Queen-street) contains, in a small compass, for six pennies, a mass of carefully-edited information, including popular facts, knowledge as to family fare, hints on gardening, a garland of anecdote, and the history of Great Queen-street, especially with reference to Franklin's press.——Readers interested in the important inquiry as to Pre-Augustine Christianity in Britain, as indicated by the discovery of Christian symbols, may be glad to know there are some interesting notes on the subject in the September part of "The Journal of the British Archæological Association."—— A paper in *London Society*, headed "How I fell into the Clutches of King Theodore," by Dr. Burette, is more than usually interesting under present circumstances. He gives a rough portrait of the king, and some curious insight into his character.

Miscellanea.

RESTORATION OF WORCESTER CATHEDRAL.—A meeting has been held at the Town Hall, Stratford-on-Avon, "to promote the completion of the cathedral of the diocese. There was a tolerably large attendance. Lord Leigh presided; and it was, on the motion of Lord Lyttelton, resolved, "That this meeting expresses its satisfaction with the progress made in the restoration of the cathedral of the diocese, and desires to reaffirm the obligation incumbent on the diocese generally to maintain the fabric in due order and architectural beauty." His Lordship remarked that the work at the cathedral had been commenced some eleven years ago, and the cost came out of the funds of the Dean and Chapter, aided by private friends, to the amount of about 30,000*l*., and it was not until that amount had been expended that an appeal was made to the diocese generally, and it was computed then that it would require 20,000*l*. or 22,000*l*. to complete what had been begun. To perfect the whole, as was contemplated, it would need an outlay of something like 70,000*l*. If they could raise a sum of 15,000*l*. the work could be completed, and in a substantial manner, according to the plans drawn by Mr. Gilbert Scott, and now placed in that room. The whole amount, in fact, which had been subscribed up to the present time was 22,053*l*., 18,867*l*. from Worcestershire, and about 3,186*l*. from Warwickshire. Sir J. Pakington moved, "That this meeting expresses its approval of the plans for the restoration of the choir, as prepared by Mr. Scott, and engages to co-operate in the attempt to raise a further sum requisite for the completion of such plan." This resolution was also carried. The subscription made in the room amounted to 594*l*. 1s. 5d., and an additional sum of 47*l*. was collected at the doors.

PEOPLE'S PARK FOR LUTON. — An offer of 43 acres of land within a quarter of an hour's walk of the middle of the town has been made by Mr. J. S. Crawley, of Stockwood Park, in exchange for a portion of the Luton moor containing 11 acres, and a sum of 2,200*l*. The offer is looked upon as a liberal one.

NEW STREET FROM LINCOLN'S-INN-FIELDS TO THE STRAND.—A new thoroughfare, being an extension of Serle-street, Lincoln's-inn-fields, intersecting the site of the new Law Courts and leading into the Strand through Picket-place, is in course of formation. To effect this it has been necessary to pull down several houses in Carey-street, between Hemlock and New Courts, and the premises in the rear. To complete a direct and continuous communication for carriage traffic from Holborn to the Strand, the houses in Great Turnstile will be pulled down and the thoroughfare widened. Thus the necessity of widening Chancery-lane will be obviated.

ABATTOIRS FOR LONDON.—The corporation of London have under consideration a scheme for erecting, at an estimated expense of 36,550*l*., a number of additional slaughterhouses at the Metropolitan Cattle-market, with all the necessary conveniences, and with the ultimate object of connecting them by railway with the new Meat and Poultry Market which the City authorities are now erecting in Smithfield. The site that has commended itself to them for the purpose is a piece of ground, about eight acres in extent, on the east side of the market contiguous to the Great Northern Railway, and sufficient for fifty-five slaughterhouses; but the City architect, who has prepared the necessary plans and estimates, only recommends the immediate erection of twenty-two, with all the necessary appurtenances. For the estimated outlay of 36,550*l*. the architect calculates that an annual revenue of about 1,680*l*. would probably be derived by the corporation from the slaughterhouses proposed to be erected in conjunction with the Metropolitan Cattle-market.

PROPOSED EXTENSION OF BRADFORD WORKHOUSE.—The committee appointed by the local guardians called on the services of Messrs. Milnes & France, architects, and they reported that the present building used as imbecile wards, and also the building used as male sick wards, should be pulled down, and new buildings erected, according to plans furnished by them. The general plan of the new building for imbeciles is in the double form of the letter ⊢⊣, the centre part being about 50 yards long by 11½ yards wide, and the two wings each about 21 yards by 11½ yards. The plan of the infirmary is the letter L, the long leg being 30 yards by 8 yards, and the short one 20 yards by 8 yards. Each building is, for the present, proposed to be three stories in height, with the exception of the short leg of the infirmary, which will be four stories, having a cellar thereunder. By the new arrangement a superior classification of patients will be effected. The imbeciles' building was estimated at 8,000*l*., and the infirmary at 4,000*l*. The consideration of the report of the committee recommending this plan has been postponed.

PATENT DIRECT-ACTING STEAM CRANE. — A satisfactory trial of a combined steam and hydraulic crane has taken place at the Duke's Dock, Liverpool, in presence of Mr. Mitchell, agent to the Bridgewater Trust, and many other gentlemen and engineers connected with steam shipping. The crane is the patented invention of Mr. A. B. Brown, C.E., of the firm of Brown, Wilson, & Co., Vauxhall Ironworks, London, by whom it was constructed. A flat containing 263 barrels of ale was placed underneath the crane, some 25 ft. below its level. These were raised, swung round one half revolution, and deposited in a warehouse in an hour and a half, the rate of lifting and swinging being in most cases two in one minute. The crane, we are informed, can raise 30 cwt. at a speed of 800 ft. per minute, and it has at the Hamburg docks, where sixteen have been at work, raised as many as ninety parcels of one ton each per hour, or 900 tons per day of ten hours, with a consumption of coal equal to 4 cwt. The advantages claimed by the patentee are as follows:—The direct utilisation of the elastic force of steam, governed by the inelasticity of water; the high working speed of load with low speed of machinery; the total absence of all cog wheels or revolving parts; lastly, extreme portability, combined with great power and speed, and without noise.

CLOYNE CATHEDRAL COMPETITION.—We have received a letter from Messrs. McCarthy & G. Goldie on this subject, but too late for consideration.

PIRACY.—The editor of the Calcutta *Engineer's Journal* will doubtless thank us for informing him that the article "Professional Skill in High Life," printed in large type in his September number, headed "Communicated," and signed "S. M.," is taken from an article published by us in March last.*

MANNINGTREE PARISH CHURCH.—The parish church of Mistley having fallen a victim to that well-known disease affecting timber, the dry rot, it is intended, if the requisite funds can be raised, to erect an entirely new edifice, at a cost of about 3,000*l*. The new church is intended to provide accommodation for 600 persons.

"RAMBLES IN THE RHINE PROVINCES."—A volume under this title, by Mr. Seddon, is about to be published by Murray. It will be illustrated with chromolithographs, photographs, and wood engravings, and has for principal object the preservation of some record of many interesting remnants of the old domestic as well as of ecclesiastical architecture, fast being interfered with by the wants of modern time. We can speak of our own knowledge of sad destruction since we first walked the banks of the Rhine, sketch-book in hand, in student days.

ONE REASON WHY LIVERPOOL IS UNHEALTHY. Some discussion took place at the meeting of the Health Committee of Liverpool, with reference to the fact that there are still in the town—in spite of the law—no less than 13,000 cellar dwellings. In answer to questions, Mr. Higgins, one of the inspectors of nuisances, said that people using the cellars had a trick of removing all traces of bedding, &c., in the day time, and the magistrates required proof—before condemning a cellar—that it was used as a sleeping apartment. In addition, the law also required two convictions in three months against a cellar before it could be legally closed.

THE MANCHESTER NEW TOWN-HALL SITE.—We understand that a meeting of members of the council favourable to some modification of the site of the New Town-hall, has been held, and, after a full discussion, the following decision was unanimously come to:—"That, whilst adhering to the choice of the Albert-square site for a New Town-hall, they were of opinion that, with a view of improving the present unsatisfactory shape, it is most desirable to extend the area so far in the direction of Dickinson-street, as to admit of the erection of a rectangular building." It was decided to call another meeting on an early day.

JOURNEYMEN BUILDERS AND THE HOUR SYSTEM. At the Sheriffs' Court, on Saturday (before Mr. Commissioner Kerr), the case of Mitchell *v.* Prince came on for hearing. This was an action to recover 1s. 8d. for grinding-money. It was contended that since the introduction of the system of payment by the hour, an allowance for grinding tools would be equivalent to double pay. The Judge was clearly of opinion that as a matter of law plaintiff could not recover the money. It had been proved to the Court that the men might terminate an engagement at any period of the day, and it would be most unreasonable to allow grinding-money when the hiring was an hourly one. Plaintiff must be nonsuited.

SALISBURY CATHEDRAL.—A number of men are just now engaged in a work which, when completed, will add materially to the beauty of the northern and eastern views of this cathedral. The work may correctly be described as exhuming a large portion of the cathedral wall, which has been literally buried for the greater portion of a century. Nearly eighty years ago an enormous barrel drain or culvert, internally 2 ft. in diameter, was formed to carry off storm waters from the cathedral roof. At that time, as no outfall could be obtained lower than the palace ditch, the culvert would have projected above the level of the ground, and in order to conceal it, it was earthed over, thus necessarily covering some feet of the base of the cathedral wall. The greatest beauty of the wall having thus been hidden, the right proportions of the building have been unseen by two generations. The culvert, being now useless, is being removed, also the earth which covered it and the base of the wall.

* See p. 165, *ante*.

STONE AT PUDLICOTE.—On the 20th, a new Primitive Methodist Chapel, at Chilson, Oxon, was opened for public worship. The chapel is built entirely with the stone recently discovered on the adjoining Pudlicote estate. Mr. R. Norton, of Chilson, was the builder.

DISCOVERY OF AN ANCIENTLY-CARVED STONE AT ILKLEY.—The excavators engaged by Mr. Metcalfe, of Bradford, in making new drains, streets, and roads, found, the other day, a stone 2 ft. deep in the excavations near the top of Green-lane, which, when turned face upwards, was found to be elaborately carved in deep relief with the representation of three figures,—a male on the left, a female in the centre, and a child on the right. The general opinion is said to be that it is of the Roman period.

THE AIR OF THE UNDERGROUND RAILWAY.—The inquest on the body of the young woman who died suddenly while travelling on the Underground Railway has resulted in a verdict of death from natural causes. The evidence of the scientific witnesses was conclusive as to the innocuous character of the atmosphere of the railway. Two independent analyses were made, and both agreed in the opinion that there were no impure gases which existed in sufficient quantities to affect the health even of passengers who were in a diseased condition of body. We never had any other opinion ourselves.

ACCIDENTS.—A chimney at Wakefield has fallen. Two men were engaged in straightening the chimney, which is some forty yards in height and had been blown crooked in a late high wind, when the chimney fell, and buried one of them in the *débris*. He was inside, and the other man on a scaffold outside. When the man inside was extricated it was found that his head was dreadfully battered, one of his legs broken, and that he had received serious internal injuries. The fallen material has penetrated the earth to a great depth.——A serious accident has occurred at Cliffe's Foundry, Bradford. The corporation, in driving the main sewer in the direction of Bowling Old-lane, have to pass it under the foundry, and a shaft has been sunk in the foundry for this purpose. A number of men were at work in the excavation, which is 19 ft. deep, and at the same time the foundrymen were preparing to cast a large bridge plate, the mould being close to the excavation. The crane-ladle, containing 26 cwt. of boiling hot metal, was swung over the mould, and the men in charge of the ladle were in the act of pouring it out, when it obtained the mastery of them, turned over, and the mass of hot metal rushed about the foundry like a wave of fire, ran into the excavation, and dropped on to the persons of the eight men who were working below. These men were on three stages, one below the other, and consequently they could not all get out quickly. They were all more or less burned.

TENDERS

For Chatham drainage. Contract No. 2. South high-level intercepting sewer. Messrs. Gotto & Beesley, engineers:—

Stiff	£5,940	0	0
Smyth & Co.	5,785	0	0
Crockett	5,400	0	0
Girdler	4,314	0	0
Naylor	4,078	0	0
Ball & Co.	4,017	0	0
Beard	3,900	0	0
Potter	3,740	0	0
Goodwin	3,733	0	0
Bugbird	3,588	0	0
Moxon & Mutton	3,420	0	0
Clements	3,350	0	0
Hubbard	3,215	0	0
Coker, jun.	2,814	0	0

What does it all mean?

For the erection of a house at Netteswell, Herts, for Mr. W. Cox. Mr. Sabine, architect. Quantities by Mr. Shrubsole:—

Nicholls	£1,505	0	0
Godbolt	1,494	0	0
Hunt (accepted)	1,297	0	0

For the erection of House and Offices at Surbiton-hill, Surrey. Mr. G. Somers Clark, architect:—

Kirk & Parry	£4,690	0	0
Browne & Robinson	4,500	0	0
Lucas	4,482	0	0
Myers	4,433	0	0
Ashby & Horner	4,221	0	0
King & Sons	3,994	0	0
Chappell	3,693	0	0

For repairs, &c., to No. 15, Grenville-street, Brunswick-square. Mr. J. Schofield, architect:—

Simpson	£204	0	0
King & Sons	198	0	0
Hussey	174	0	0
Lawrence & Baugh	168	15	0

For Church of St. Chad, Haggerston. Mr. James Brooks, architect:—

Hill & Sons	£7,670	0	0
Piper & Wheeler	7,188	0	0
Perry & Co.	6,996	0	0
Higgs	6,780	0	0
Longmire & Burge	6,757	0	0
Foster	6,497	0	0
Hill & Keddell	6,387	0	0
Ennor	6,144	0	0
Ashby & Sons	6,140	0	0
Henshaw (accepted)	5,990	0	0

For Church of St. Columba, Haggerston. Mr. James Brooks, architect:—

Perry & Co.	£9,065	0	0
Longmire & Burge	8,877	0	0
Foster	8,700	0	0
Higgs	8,375	0	0
Ashby & Sons	8,140	0	0
Ennor	8,130	0	0
Piper & Wheeler	7,990	0	0
Henshaw (accepted)	7,894	0	0

Clergy House, St. Michael, Shoreditch. Mr. James Brooks, architect:—

Ashby & Sons	£2,660	0	0
Hill & Sons	2,535	0	0
Hill & Keddell	2,370	0	0
Henshaw	2,343	0	0
Foster (accepted)	2,342	0	0

For repairs, Wolstanton Vicarage, Staffordshire. Mr. James Brooks, architect:—

Barlow	£1,090	0	0
Sutton	963	10	0
Lowe	955	16	0

For building new casual wards for the City of London Union. Messrs. Tress, Purchas, & Willis, architects. Quantities by Mr. G. P. Raggett:—

Wood	£3,860	0	0
Ramsey	3,840	0	0
Holmes	3,651	0	0
Garrud	3,500	0	0
Stangle	3,398	0	0
Marter	3,207	0	0
Egg	3,140	0	0
Lacey	3,110	0	0
White	3,096	0	0
Crook	3,010	0	0
Langley	2,997	0	0
Turner	2,990	0	0
Sheffield	2,989	0	0
Hall	2,980	0	0
Wilt & Son	2,924	0	0
Mote	2,913	0	0
Perkins	2,894	0	0
Cooper	2,890	0	0
Bland	2,889	0	0
Wyatt & Son	2,849	0	0
Henshaw (accepted)	2,768	0	0

For detached villa residence in the Seven Sisters'-road, Stoke Newington. For Mr. Henry Taylor. Mr. A. Manning, architect:—

Brisby (accepted)	£1,250	0	0

For a detached house in the Seven Sisters'-road, for Mr. J. Andrews. Messrs. Franklin & Andrews, architects:—

Brisby (accepted)	£1,160		

For proposed new Cemetery, Biggleswade, Bedfordshire. Messrs. Ladds & Hooker, architects. Quantities by Mr. Glenn:—

	Chapels.	Lodge.	Entrance Gates, &c.	Boundary Walls.
Chapell	1,020	342	173	250
Bates	964	301	166	231
Redhouse	913	296	172	223
Thomas & Son	856	273	145	238
Roy	845	256	139	220
Howe*	815	259	134	192

* Accepted subject to revision of Lodge.

For house at Sutton. Mr. W. A. Murphy, architect:—

Smith	£1,714	0	0
Potter & Co.	1,690	0	0
Sharpington & Cole	1,617	0	0

For parsonage house and offices, Temple Grafton, Warwickshire. Mr. Thos. T. Allen, architect:—

Giles (accepted)	£1,530	0	0

TO CORRESPONDENTS.

F. H. & P.—J. N.—B. F.—H. J. & H.—J. B.—T. L. P.—A. L. N.—J. O. A.—K. & Sons.—Mr. C.—T. F. P.—W. R.—L. & H.—C. J. A.—W.—E. H.—R. N.—F. P.—J. P. P.—W. F. J.—G. & B.—J. R.—S. & C.—H. K. B.—F. M.—Skewtack, India.—Keystone, India.—J. C.—F. T.—Mr. S.—J. G.—B. W. & M.—W. R.—A. S.—A. J. B. H.—S. A. H.—J. D. P. (shall appear).—T. B. S.—T. B. (apply to the Board).—J. H. D. (will call).—A Victim (architects have at present no protection against piracy. There is no copyright as to a building when erected.)—J. W. (cancelled, having appeared elsewhere).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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